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*The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.*


## CONTENTS.

An Asterisk (*) Denotes an Illustrated Article.


OFFICIAL NOTICE—

Wrinkle Department, American Gas Institute..... 45

EDITORIALS—

Briefly Told ..... 45

The Sixth Annual General Meeting of the British Institution of Gas Engineers—A Northwestern Gas Association—Current Comment.

*The Pennsylvania Railroad Terminal: Maintaining Sewer and Water Pipes in Connection Therewith..... 46

Proceedings, Seventh Annual Meeting, Wisconsin Gas Association—Official Report—Continued from page 8..... 47

Second Day, Morning Session—The Necessity of Proper Maintenance of Meters, by Mr. E. S. Dickey—Discussion—An Apology—Report of Nominating Committee—Election of Officers—Next Place for Meeting—A Resolution in Connection with the National Commercial Gas Association.

Review of the Twenty-third Annual Report, Board of Gas and Electric Light Commissioners, Commonwealth of Massachusetts.—[No. V.]—By Mr. H. Thurston Owens..... 52

*Sign Lighting by Gas..... 53

Attention to Consumers, by Mr. Thomas Crawford..... 53

*Three Methods of Tar Disposal, by Mr. W. H. Taylor..... 54

The Delinquent Account, by Mr. A. W. Borden..... 55

A Gas Manager's Relation to the Public and to the Employees of His Company, by Mr. W. E. Davis..... 57

ITEMS OF INTEREST FROM VARIOUS LOCALITIES..... 58

Mr. Mayers Gets a Good Concession—Contract for the Gas Machinery Company—The General Gas Light Company's New Lamp—Minute to the Memory of John K. McIntire—The Beloit Company's Change of Base—Piping Times at Macon, Ga.—Death of Mr. H. R. Smith—A Chatty Letter from Mr. Aldrich—The Baltimore Company's Ball Teams' Record—Wedding Bells—Proposed Plant for Decatur, Ind.—Personal—The Method followed by Inspector Burn—An Opinion *in re* the Dubuque, Ia., Case—Looks Like an Interloper—Contract for the Kerr Murray Company—Tar Prices, Richmond, Va.—And Many Other Items.

The Market for Gas Securities..... 60


[OFFICIAL NOTICE.]

### Wrinkle Department, American Gas Institute.

To the Members of the American Gas Institute: All members of the Institute are earnestly requested to send in as soon as possible contributions for this year's Wrinkle Department report. The success of the Department depends entirely on the co-operation and assistance of the members.

Mail all contributions to Milan R. Bump, Editor, No. 60 Wall street, New York city.

## BRIEFLY TOLD.

THE SIXTH ANNUAL GENERAL MEETING OF THE BRITISH INSTITUTION OF GAS ENGINEERS.—From the reports of the proceedings of the Sixth Annual General Meeting of the British Institution of Gas Engineers, as contained in copies of the *Journal of Gas Lighting* and the *Gas World* recently to hand, it is easily determinable that the meeting was an eminently successful one, from whatever point of view one selects to look over it. The sessions were held on the 16th, 17th and 18th of June, in the hall of the Institution of Mechanical Engineers, and in the Congress Hall of the Franco-British Exhibition, Shepherd's Bush, London. The displays in the latter included a Gas Section, wherein were shown a great number of appliances and a noble show of apparatus, quite indicative of the high place that is filled in the mechanical world by the makers and sellers of gas. The attendance was excellent and the capability of the officers in directing and controlling the routine of business was perhaps never better shown in the history of the Institution. The President (Mr. W. Doig Gibb, M.I.C.E., of Newcastle-on-Tyne, ably abetted by the Secretary, Mr. Walter T. Dunn) was most happy in his control of the sessions, and not only so but markedly successful in his presidential message. As to the latter, however, we may safely leave our readers to judge, since we were enabled to print it in full in our issue for last week, although it may properly go here to remark that, from first to last, it certainly is fit to hold the careful attention of any gas man, no matter where his field of work. The paper list was an excellent one, but naturally the set numbers, on carbonizing as carried on in vertical retorts, will attract the greatest attention in America. The particular numbers on this subject were by Mr. A. F. P. Hayman, of Berlin, who broadly stated that in Germany the vertical plan easily held the field against all comers; and by Mr. Harold W. Woodall. Perhaps the two papers were not entirely akin in subject, but in any event, Mr. Woodall did not seem nearly as sanguine over the present standing of the vertical retort working as did Mr. Hayman. That world known and well beloved Dean of the Industry—Sir George Livesey—whose vitality may not be sapped and whose mentality may not be dulled by the piling on of years, was on the list. The veteran wrote under the titling, "Co-Partnership," and his presentation of the subject was such as might be expected from a man who had been a pioneer in this work and who is a practitioner of it in the vast plant over which he presides. The lecturer was Dr. W. A. Bone, F.R.S., Professor of Fuel and Metal-


LIBRARY OF CONGRESS JUL 13 1908 SMITHSONIAN DEPOSIT.

lurgy in the University of Leeds, whose subject was the rather intricate one of "The Combustion and Thermal Decomposition of Hydrocarbons." Take it all-in-all, the meeting lacked nothing in the shape of proper mental pabulum. The London Gold Medal was awarded to Mr. J. H. Brearley, of Longwood, for the paper prepared by him on "The Testing and Hygienic Efficiency of Gas Fires." The Silver Medal went to Mr. F. W. Goodenough, and the Bronze Token was intrusted to Mr. A. G. Glasgow, for delivery to our own Mr. Robert M. Searle, of Rochester, N. Y., for his 1907 paper before the Institution on "High Pressure Development in the United States." Mr. Thomas Glover, of Norwich, was elected President, and Mr. Alex. Wilson, of Glasgow, was elected Vice-President—he serves in conjunction with Mr. James W. Helps, of Croydon, who was chosen last year. Next year's meeting will be held in London, although more than a word was said in favor of Norwich, and Leeds, too, would be pleased over being named. Many enjoyable things were gone through with on the social side, and the greatest of these was undoubtedly the general reception held by the President and Mrs. Gibb, the evening of Wednesday, the 17th June. This was happily brought off in the world-famous galleries of the Royal Institute of Painters in Water Colors, Picadilly. There it was evident that if President Gibb was an orator and a parliamentarian, he has for a consort and helpmeet one whose tact and graciousness as a hostess cannot be surpassed.

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A NORTHWESTERN GAS ASSOCIATION.—We are indebted to the attention of Mr. H. M. Papst, the clever General Manager of the Portland (Ore.) Gas Company, that the formation of a gas association to cover the great territory of the Northwest, has passed well beyond the thinking stage. In fact, the following circular letter, which was mailed to all interested in the gas business in the sections referred to last month, goes to show that it will only be a short time when the Northwestern Gas Association will be an actual working body. The letter reads:

Dear Sir: It is thought that there is a wide field of usefulness open to a gas association in the Northwest, comprising British Columbia and the States of Washington, Oregon and Idaho. I feel sure that it will satisfy a long felt desire for mutual exchange of thought and friendship. I have taken the liberty of addressing this call to all the officers of the 20 gas undertakings in the Northwest, in order to receive their expressions of approval. Hoping that the consensus of opinion will be in the affirmative, I beg to remain,

Very truly yours, H. M. PAPST.

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CURRENT COMMENT.—

AT the annual meeting of the shareholders of the Louisville (Ky.) Gas Company, the following Directors were elected: F. M. Sackett, D. X. Murphy, H. B. Loving, John Stites and M. L. Akers—the last named succeeds Mr. Udolpho Snead, resigned.

MESSRS. GEORGE KIMBALL and Anthony Plume, formerly in the service of the Childs-Hulswit gas enterprise at Cadillac, Mich., have been transferred to the Childs-Hulswit plant at Mattoon, Ills.

MR. J. E. SMITH has resigned the position of Superintendent of the La Crosse (Wis.) Gas and Electric Company to accept a similar one on the staff of the Cheyenne (Wyo.) Company.

MR. J. W. TILFORD, of Nashville, Tenn., has applied to the authorities of Columbia, Tenn., to there construct and operate a gas plant. He agrees to fix the maximum selling rate at $1 per 1,000 cubic feet.

UNDER the profit sharing plan adopted by the New Haven (Conn.) Gas Light Company, between the corporation and its employees, which scheme became operative in 1907, the men now own a total of 271 shares.

THE Massachusetts Board of Gas and Electric Light Commissioners has approved an issue of 2,000 additional shares of stock by the proprietors of the Worcester Gas Light Company. The Commissioners name $200 a share as the upset market price.

SOME months ago the news was spread broadcast that a man named Harper had purchased the Beatrice (Neb.) gas plant, in which he was going to revolutionize the gas industry by making gas from "waste corncobs," the gas to be of 18-candle power and to cost to manufacture not in excess of 11 cents per 1,000. The works are now once more making coal gas, and Mr. Harper explains the return to first principles in the remark that the corncob system produced too much tar.

THE new coal gas plant which was put in work at Laurium, Mich., something over a year ago, has already outgrown its generating capacity owing to the rapid growth of the place, and to the hustling energy of General Superintendent, C. C. Sloan. The Calumet Gas Company has, therefore, awarded a contract to the Gas Machinery Company, of Cleveland, O., for a complete new 6 feet water gas apparatus, two 10 feet by 12 feet by 11 feet 6-inch purifiers, together with exhauster, oil storage tank, yard connections, etc. A new purifier house and suitable meter room will also be constructed.

MR. F. W. LELAND has resigned the position of Superintendent of the Federal Gas Company, of Boulder, Col. Meanwhile the plant will be run by Mr. T. V. Wilson, executor of the A. J. Macky estate, which owns a controlling interest in the Federal Company.

GENERAL MORRIS SCHAFF has been appointed to succeed himself on the Massachusetts Board of Gas and Electric Light Commissioners.

MR. WALTER C. BAYLIES, a prominent member of the Executive Committee of the Massachusetts Gas Companies, is Acting President of the Edison Electric Illuminating Company, of Boston, during the absence of Mr. Chas. L. Edgar in Europe.

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## The Pennsylvania Railroad Terminal: Maintaining Sewer and Water Pipes in Connection Therewith.

[Prepared for the JOURNAL, by "O."]

The terminal of the Pennsylvania Railroad, which is being constructed in New York city, West of Sixth avenue between 31st and 33d streets, will occupy a site which is nearly 6 city blocks in area, and, when completed, will be one of the most commodious and handsomest railroad stations in the world.

Some of the former streets will be closed and the others will be so reconstructed as to allow the use of practically all of the sub-surface by the Railroad Company.

Most of the public utility pipes, ducts, etc., have been removed and the adjacent buildings connected to temporary lines. The trunk sewers and the main water supply lines could not be removed without seriously interfering with the existing arrangements so they have been maintained as follows:

The original sewer was of brick and, as the sub-surface was practically all rock, it was necessary to lay a 36-inch cast iron pipe to replace same. The water main, which is 20-inch, cast iron, was left in position. These pipes were inclosed in a wooden cradle and supported on wooden posts, as shown in the illustration.

Pennsylvania Railroad Terminal, 7th Avenue and 33d Street, Looking N. E.

These pipes will eventually be supported from the ironwork constituting the roof of the sub-surface building forming the train shed. The drains, which are being laid in the rock foundation under the new level of the station, are also of cast iron.

[Official Report.—Continued from Page 8.]

## PROCEEDINGS, SEVENTH ANNUAL MEETING, WISCONSIN GAS ASSOCIATION.

Held in Milwaukee, Wis., May 14 and 15, 1908.

### Second Day—Morning Session.

The convention was called to order by the Vice-President at 10 A.M.

The Vice-President—The first thing on the programme this morning is the paper by Mr. E. S. Dickey, of Baltimore, Md., on

### THE NECESSITY OF PROPER MAINTENANCE OF METERS.

As the author is not present I will call on Mr. C. F. Asendorf to read it.

Mr. Asendorf read as follows:

In taking up the subject matter for discussion under this heading, it might be well to note the great variety of opinions existing among the different gas engineers, managers and superintendents of distribution as to how a meter should be maintained in order to secure the greatest efficiency from the individual apparatus. The matter of maintenance is one the importance of which is ofttimes overlooked, not merely in respect to the gas meter, but in respect to almost any physical property. The owner of real estate, in the form of dwellings or business houses, may fail to provide necessary maintenance for his property, with the result that sooner or later he will find a very marked depreciation in value. The manager or superintendent of a manufacturing plant may feel that, as long as the plant is in apparent successful operation, or more specifically, as long as an individual machine may continue to run, he is securing his best results at a minimum cost for repair or replacement. At the end of a given period the fallacy of this idea will readily show itself in the dilapidated condition of plant in general, and with any particular machine the condition will be such as to often relegate the individual machine to the scrap pile long before its actual days of usefulness should have terminated, had proper care and maintenance been given to the apparatus. These are all tangible facts. We can readily grasp and appreciate the necessity of repainting a dwelling, and in similar manner we can readily understand the necessity for proper maintenance of machinery, or of an individual machine, such, for instance, as the machinist's lathe, where the working parts are open at all times for inspection, etc. The proper maintenance of a gas meter, however, does not present the same aspect. The gas company buys a gas meter, and to the smaller companies especially, which are lacking the facilities of a regularly equipped meter repair department, this new meter represents a sealed book so far as any inspection of its actual working parts may be concerned. The question very aptly comes up, "How can a piece of apparatus, such as a gas meter, adapt itself to any exterior condition which might assist in its maintenance; or, in other words, adapt itself to exterior conditions which would assist in its regular work, with the ultimate result of either increasing its efficiency or lengthening its term of service?" While it would appear that with an apparatus of this class exterior conditions would not materially affect the meter itself, yet general experience has proven that the proper maintenance of a meter to a great extent is controlled by exterior conditions.

In the first place, a meter purchased new, coming to the gas company from the manufacturer, is assumed to be correct in respect to registration, and is assumed to be in good working order, ready for immediate installation on service line without inspection or test by the purchaser. These assumptions of accuracy and reliability are practically correct, and referring as they do more particularly to the interior mechanism of the meter, they are generally applicable with meters of any reputable meter manufacturer in this country. But exterior conditions are also entering at this point. Meters purchased are sometimes subject to rough handling in transportation, which may occasionally cause breakage of interior parts; but as above stated, these occasions are rare. One point, however, which should be closely watched, in respect to the condition of new meters when received, is the condition of the paint used on the outside of meters for protective purposes, and if this paint has been scratched in transportation, exposing the bright plate, the meters should be repainted or touched up before being set in service. A second item comes directly under the superintendent of distribution or the superintendent of meter department, in respect to the handling of meters by the street gang in transportation to the various consumers' premises. There was a time when the average fitter or wagon man assumed that meters could be thrown promiscuously in the wagon—top, bottom or side up—and carted as so much junk over rough streets; but it is very gratifying to be able to now say that a condition of this nature has become an exception. Meters should be carried at all times top up, should be handled carefully, and, if loaded on a wagon for transportation through streets, each meter should be separated, either by a pad or at least by burlap, rag, waste or some other similarly soft substitute.

This approaches the question of setting of meter on service line, and at this point considerable care should be taken as to the place selected for the meter. A gas meter should not be set in a damp place, it should not be hung too close to a damp wall, nor yet should it be in too close proximity to the heating plant in the building. Another reason against setting a meter too close to the cellar wall is one which will only show in some localities, but which, nevertheless, will at times cause rapid deterioration in the meter—this is a question of electrolysis and its effect is clearly indicated when a meter is brought to the repair shop showing numerous holes of varying size in the back and bottom of case while the case, in all other respects, is in good condition. Upon further investigation this condition is usually found to be due almost entirely to electrolysis. Every fitter employed by a gas company should be cautioned to see that all joints are gas tight before leaving a job as finished on the consumers' premises, but at the same time the fitter should be cautioned not to use a wrench designed for a 6-inch union on a 1-inch meter connection, as excessive strain on meter unions will very often wrench the entire meter screw from its socket. This, however, is practically out of the question with the riveted type, tube-screws now used on a great many meters; but, even with these riveted screws, it is possible for a fitter to cause leakage from undue strain at this point.

With the meter now connected on service line we have as yet hardly touched the question of maintenance in its positive relation to the life of a meter. Opinion among engineers throughout the country differs greatly as to the best method of handling meters when once set in service. As previously stated, it is very evident that exterior examination will not indicate conditions inside of the meter; and from this fact has gradually grown the policy of meter removals for inspection purposes. The meter manufacturer recognizes several favorable points in connection with the removal of meters for inspection purposes, yet there is one strong point in this same connection which the meter man cannot overlook. A new meter when manufactured, prior to its passing any gas, is very carefully handled by the manufacturer, not only in respect to actual physical handling but also in respect to interior conditions, and is above all things kept carefully sealed at the tube screws to prevent atmospheric circulation in it, as the manufacturer knows from experience that a meter sealed will retain its original proof records in much better condition than one left unsealed. This same question of atmospheric contact with the interior of the meter is also a matter to be taken into consideration in connection with the policy of meter removals, for, when a meter is once placed in service, the gas in passing through the meter will produce certain changed conditions on the interior of the apparatus, notably upon the diaphragms and valves and also on other working parts; but the general effect of this gas action will vary greatly, depending on the style, quality or grade of gas as manufactured. The gas once having had its effect on these interior parts produces, as stated, certain changes, which changes of themselves in a great majority of cases do not radically affect the operation, efficiency or accuracy of the meter. A different condition, however, immediately presents itself when the meter is disconnected from service and the atmosphere is allowed to come in contact with the interior parts of the meter, as the changes produced, owing to the effect of atmospheric action, will almost immediately make themselves felt.

We have just referred to the effect of different gases on the interior mechanism of a meter, so a word on this subject might be of interest. At one time the vast majority of gas manufactured in the United States was of the class generally termed coal gas, and meters in service in conjunction with this gas worked under conditions far more advantageous than with meters operating to-day when used in conjunction with the drier type of gas as now more generally manufactured. The old coal gas contained by-products which, of themselves, greatly assisted in the preservation of meter diaphragms, and at the same time, as a general rule, materially assisted in the lubrication of meter valves. The drier gases as now manufactured, however, do not offer this assistance to the operation or preservation of the meter, but, nevertheless, cause very little if any trouble on the meter valves with exceptional cases where it will show the valves to be more or less gummed from dry condensation. Another possible effect of the drier gas will show itself in its action on meter diaphragms; in some

localities a comparatively dry gas will be used without apparent material deterioration in the diaphragm, while in other localities gases of somewhat similar nature will cause a gradual absorption of the original diaphragm oils, leaving in place thereof a light, extremely volatile oil, which, of itself, however, if protected from atmospheric contact, and also protected from too violent changes in temperature, will serve as a substitute for the original diaphragm oils and will maintain the diaphragms in working condition. A meter in which the diaphragms have been subjected to such action, if disconnected from service, thereby allowing the atmosphere to come in contact with the diaphragms, will almost immediately change its proof record, as the volatile oil left in the diaphragm will quickly pass off, leaving the leather bleached to its natural color, even whiter. In further respect to exterior conditions, as relating to the maintenance of a meter, it might be well to note that the diaphragms of a meter operating under a gas of this nature, when subjected while in service to violent temperature changes, will alternately pick up and discharge the free oil vapors carried in combination with the gas, the alternate action thus produced acting directly on the diaphragm oils and tending to produce a dried leather similar to leathers exposed to the atmosphere.

The gas action just referred to, while not general, is yet of sufficient importance to necessitate careful investigation, and numerous experiments are now being made, not only by the manufacturers but by some of the larger gas interests, with the view of correcting this trouble as experienced in the drying out of diaphragms. Different oils are now being tried out, and one notable experiment is being conducted on quite a large scale in the so-called process of "dipping" meters. This process was fully covered in two different papers presented at recent meetings of the American Gas Institute, and briefly may be described as the method under which a certain amount of surplus oil is introduced in the bottom of each diaphragm compartment of the meter prior to setting the meter in service, the volume of oil introduced in each compartment being sufficient to allow the lower edge of the diaphragm to remain immersed in the oil, the theory being that the diaphragm will automatically oil itself from this surplus oil by capillary attraction. The advisability of introducing this dripping process is one depending greatly upon the relative cost of handling all meters in this manner against the operating costs in taking care of such meters as may from time to time show the effect of dried diaphragms; further, the necessity for the adoption of the dipping process is entirely dependent upon actual conditions in respect to dried diaphragms as presenting themselves to each local gas company. It might be further stated at this writing that the ultimate results to be obtained, either from the experiments with various oils or from the dipping of meters, cannot be fully stated, as the process is as yet to a certain degree in the experimental stage. From these remarks it may be understood why it would be desirable to as far as possible allow meters, when once set in service, to remain undisturbed, as undoubtedly a meter will very readily change its proof record coincident with any decided change in the condition of the diaphragm, especially when the diaphragm condition is changed owing to atmospheric contact on leathers which have been subjected to gas action. When this situation is carefully considered, it would seem as though the general removal of meters, merely for testing purposes, would not show as being particularly good practice, for undoubtedly it is very often a fact that a meter registering correctly in service will be removed, left exposed, or possibly left without test for a considerable period of time, and when finally tested out will show inaccuracies which did not exist in the meter's proof record during the time the meter was in active operation.

It might be well, before dismissing this subject, to give some little additional attention to the question of the removal of consumer's meters from service lines. At times it is necessary to remove a meter, either owing to consumer's complaint for the purpose of proof tests, or owing to the discontinuance of the use of gas, and in this event the gas manager or superintendent should see that very great care is taken in the handling of the meter from the time it is removed from the consumer's house until actual tests on the meter have been completed. The average street employee, and very often the superintendent of distribution, will not realize the importance of keeping the meter so that final removal tests can be made as nearly as possible under conditions that existed at the time the meter was in service, and, on a job of this nature, when the street man disconnects the meter, he should immediately, upon breaking the pipe connections, see that the meter is instantly closed at the tube screws, using either corks or tin meter caps for this purpose. The meter should be carefully handled and should be kept as nearly as possible in an upright position during its return to the meter shop. The meter upon arrival at shop should be placed in the testing room, and left in this room for at least 24 hours, if possible, 48 hours, without removing the seals from the meter screws, the purpose being to allow the meter to as far as possible secure an even temperature with that of the testing room. In testing, the meter should be tested with *gas*, as it has been operating under gas and tube screws have been closed purposely to prevent the atmosphere coming in contact either with valves, diaphragms or other working parts of the meter prior to the making of the test, the importance of keeping the tube screws closed being covered entirely by the question of the atmospheric action on meter valves, diaphragms and other parts, after a meter has once been in service and subjected to the action of gas. The valves will quite often carry on their surface a certaim amount of condensation or the diaphragms will hold a certain amount of gas oil, all of which is materially affected if exposed to the atmosphere. If a removal meter is handled in this manner and test made as described, the result obtained will be an exact record of the actual proof of the meter as it was operating while in service.

In the maintenance of meters it is quite necessary to arrange a systematic method of records covering the history of each individual meter. This is usually accomplished by using the card system, adapting the card to meet the requirements of such records as it may be desirable to keep. A number of papers have been presented from time to time at the different Association meetings illustrating sample cards, and giving general detail as to records kept.

The writer was requested to give a few words on the maintenance of a gas meter, and, as far as possible, has attempted to give data on this subject, admittedly a somewhat difficult proposition considering the closed-in and sealed construction of the gas meter. There is, however, a further matter which properly belongs to this same question of maintenance, and that is in respect to the handling of removal meters in the matter of repair and replacement for the purpose of preparing them for further service or additional length of life. With a smaller gas company, not maintaining its own repair shop, it is often a question with the manager of such a plant as to the best method of procedure in handling his consumers' meters when removed from service, more especially how far he should go in the repair and adjustment of such meters as are found to be incorrect. In order to cover such a situation in any intelligent manner it is necessary to assume that the smaller gas company would have among its equipment an accurate and well maintained meter prover. To attempt to lay down any definite and fixed rule to govern all smaller gas companies would be out of the question, as local conditions ofttimes bring up different problems which will not lend themselves to correction as readily as conditions in other localities; and it would, therefore, be well to merely cover this ground in a general manner based on general experience with this class of work.

The matter of any repairs which a smaller gas company could make, while not maintaining a completely equipped repair shop, would depend greatly upon the point as to whether or not the company would have at its works a man capable of handling a soldering iron, as there could practically be no repairs made unless such a man were in the employ of the gas company. On the other hand, if the company has a man capable of doing ordinary tinning work with a soldering iron, a considerable benefit would accrue to the gas company in handling all removal meters in the following manner: When meters are first brought to the shop they should at once be placed in testing room for the purpose of proof test, providing the individual gas manager would desire to keep all proof records on removal meters. After completing this preliminary proof or record test, the meter should at once be placed on test to insure against inside leakage in the meter as follows: The top of meter should be removed and the meter should be connected to gas supply with a pilot burner placed on outlet of meter, then light the pilot burner, turn down to an exceedingly small flame, and under this consumption make sure that your meter will make a complete revolution of the tangent within a reasonable period of time. A 5-light meter, with flame turned sufficiently low to burn only blue flame, should make a complete revolution of the tangent in about 3 hours, and, if the meter does not make this revolution within a reasonable period of time, you may be assured that you have a by passage of gas from inside leakage, possibly leakage in the diaphragms, leakage in the valves, or possibly sufficient lost motion from wear to prevent the meter from operating correctly. It might be suggested, however, that the pilot burner test, with as low a flame as the blue flame thus described, is quite a severe test, and it would possibly serve

the purpose of an ordinary gas company to use a somewhat higher or larger flame in making this so-called burner or pilot test. If on making the burner tests your meter should not make a complete revolution, it is very probable that the condition of the diaphragms is bad, that the valves probably need regrinding, or some other defective condition exists in the interior of the meter, and with the small company, not maintaining a complete repair department, it would be better with a meter of this class to discontinue any further work and set the meter aside to be forwarded to a regularly equipped repair shop.

Reverting to the pilot test, if meter should pass this test correctly it would indicate a fair condition in the interior, and it can then be immediately retested for correct adjustment, topped-up and be ready for a new service connection. It would be advisable, however, before proving and adjusting meter, to remove the flag arms from the tangent posts and revolve the tangent very slowly by hand to determine whether the valves of the meter were dirty; if the valves are gummed a perceptible drag can be felt by slowly revolving the tangent, and if this drag should be noticeable it would be advisable to clean these valves before attempting to make proof adjustment on the meter. This can be done with very little labor by removing the back plate, thus giving access to the valves themselves, and then remove the covers from the valves, clean both valve seats and covers with a rag moistened with benzine, replace the covers and re-back plate the meter, but it should be noted that, if the valves are cleaned, care must be taken not to cause any burr or to in anywise disturb the surface of either valve seats or covers, as these valves must be kept perfectly level to insure being gas tight; and further, in replacing the covers on the valves particular care should be taken to see that the cover arms are properly attached to the valve wrists and held in position either by the wrist nut or wire used for this purpose. It should also be noted that, when meter has had backplate removed as above described, it should be tested under pressure of at least 9 inches water column *after the backplate has been resoldered into position*, as a test of this nature will serve to immediately show any leakage in the new solder seams. Any meter in which valves have been cleaned, after being tested under 9-inch pressure for leakage, should be placed as a repaired meter on pilot or burner test, and after passing this test should then be reproved for proper adjustment before being retopped and ready for service. This would practically cover about all the work which could be undertaken by a small company in handling its meters, as to go further into this work necessitates the removing of backs and fronts from the meters, the examination of diaphragms and other detail work, which could only be handled properly by a regularly equipped meter shop.

The larger gas companies are, of course, equally interested in the maintenance of their meters, and are also equally interested in that portion of the meter maintenance covered by meter repair work. A great many of the larger companies maintain their own repair shop, and, with companies of this class, meters should be handled in a general way similar to the manner just described for the smaller companies, a fully equipped shop, however, affording the larger company opportunity to take care of all grades of meter repair work, including when necessary, the complete stripping of meters, etc. With some of the larger companies it is desirable to have a record of proof tests on all meters removed from service; other companies, however, do not desire to keep this record. Should the record not be desired, about the quickest procedure would be to take meters on receipt of same at shop, immediately remove tops and place meters on burner or pilot test, but with some companies even this pilot test is omitted, and meters upon being brought in are immediately opened; that is, the top, back plates, backs and fronts are removed. After removing these parts the diaphragms are carefully inspected as to condition and tested as to leakage. If the diaphragms should pass this inspection the meters are set on the oiling table and the diaphragms are re-oiled from the outside without being removed from the case, being allowed to remain at least 24 hours in oil bath, then receiving a second oiling, after which they are again allowed to stand at least over night. On the following day the interior of the diaphragm compartments can be cleaned of surplus oil, the diaphragms tested, and, if the diaphragms now show tight on pressure test of from 3 to 6-inch water column pressure, the case should again be carefully cleaned out preparatory to putting on the backs and fronts, thus closing in this portion of the meter. When this work is completed it is necessary to clean out top of meter above meter table, carefully cleaning the valves and all fittings, after which the covers are placed in position and the valves tried for tight. If the valves show leakage they should be reground, both valve seats and covers, after which the meter is ready to have the backplate put on and in turn is ready for pressure, pilot and proof tests.

This operation would cover the so-called general repair meters, but it might be well to note here the practice which is quite general in the repairing of meters in respect to work done on general repairs. It is the custom with quite a number of gas company repair shops, on opening a meter, to remove only the top and backplate, and should they find the diaphrams to be tight, to proceed at once in cleaning up and if necessary regrinding the valves, placing on backplates and making final tests. As against this practice, some of the companies are now adopting the shop rule, as covered by my earlier comment, in requiring not only the tops and backplates, but also the backs and fronts to be removed from all meters, even though diaphragms should show tight, doing this extra work as it affords an opportunity for an examination and re-oiling of the diaphragms before finishing out the meter as a general repair, and, as the additional cost of removing the backs and fronts is so small an item, it would appear as though this practice were a very good one, and it certainly deserves consideration at the hands of any shop foreman. When diaphragms are in bad condition it is, of course, necessary to strip or remove the old diaphragms, after which it is customary to boil out the stripped case in a caustic soda bath. Before sending the cleaned skeleton cases to the regular repair man, the cases should be tested under at least 6-inch water column pressure to detect leakage in channels, etc., which may have been caused in the stripping or tinning process, after which, on bringing the meter to the regular shop, the repair work could commence by replacing old parts with new equipment, using, however, as far as possible, the old guide wires, disks, etc., and, after testing diaphragms for tight under pressure of from 3 to 6-inch water column, proceed to finish meter as with a general repair. It is, of course, optional with a gas company in its repair shop as to how much detail they would care to go into in respect to the use of new fittings, new indexes, new index boxes, etc., or the cleaning in acid of the old index movements, the using of old disks, old backplates and other items of this nature.

*Discussion.*

The Vice-President—Mr. Dickey certainly went into this question thoroughly, and the subject is one to which we can all give a great deal of consideration. To my mind the meter is in a sense the personal representative of the company in its dealings with the public, and if it is conducting itself properly our consumers are very apt to have a good opinion of its owners. Perhaps Prof. Burgess will give us an idea of some conditions that the Commission found to exist in connection with meters throughout the country. Although that has nothing to do with the maintenance of the meter, according to this paper, it shows the necessity for this very class of work outlined by Mr. Dickey.

Prof. Burgess—Any information I can give would likely not be new to the members. Quite likely that later results of tests at different places classified may show some interesting comparisons. I am interested in the statement there was a possibility that, during recent years, the meters may have been subjected to different conditions than they formerly were subjected to, through passing so-called drier gas. It has been observed by our inspectors that a larger percentage of the meters run faster than was expected, and it may be that in the places where such results were obtained they were due to some quality of the gas rather than to any change in meter construction during recent years.

Mr. B. H. Spangenberg—I want to express my appreciation of Mr. Dickey's paper, who covered the ground very thoroughly. I do not know that I can add anything to what he has said. One thing I would point out, though, is I know from observation that the greatest percentage of errors in the proof of meters is due to the change in diaphragms, and that is being taken care of by dipping oil, which should be introduced into every gas works where trouble exists from bleached diaphragms. I think the day will come when all diaphragms will be automatically oiled, and I think they should be, because the errors that are due to changes in the moving parts of the machine, the valves, valve arms and other moving parts, constitute a smaller percentage. Mr. Dickey also referred to the testing of meters with gas. For myself I think that is impracticable. I do not say that it could not be done, but there are things practicable and things possible, as Mr. Beggs said last night, and in testing a meter with air the test usually covers from 2 to 4 feet of air put through, which means an absolute clearing or purging of the meter, and the conditions in the meter will have changed by the time of the first foot going through. So that the air which will follow will be just as good

a testing medium as the gas would, and be far cheaper and safer. Another point that Mr. Dickey mentions is electrolysis of the back and bottom of the meter case. That is new to me. It may be so, but I am rather inclined to believe the pitting came from moisture.

Mr. Brown—I am surprised to hear Mr. Spangenberg say that it is impracticable to test with gas, also that it is dangerous to test with it. There may have been accidents come from it, and it may have been that he has found some difficulty in its use, but so far as I know with our experience here, we have never found any difficulty in testing with gas, and we considered we got better results than through testing with air. The increase in expense has been so immaterial that we would not consider it an argument pro or con. We never had an accident of any character whatever traceable to the use of gas in testing. I am surprised also at his statement that the valves and mechanisms of the meter show such a small percentage of trouble that they can be ignored. As a matter of fact, we have had more trouble with the valves and valve mechanism than with all the diaphragms put together, as far as smoothness of operation and reliability are concerned. We have demonstrated to our complete satisfaction that an oiling system for the valves will allow us to put through a 5-light meter on our test lines, more than 5 times the average total passage which a 5-light meter handles in a 4-year term of life, and show perfect proof at the end, while the same test, without proper oiling of the valve seats and valve mechanism, will not show even the full complement which we might consider as the average passage of a 5-light meter in 4 years, before it would show trouble. Of course, we would expect on our test lines, where the gas is warmer and drier than it would be found in average conditions in a residence, for instance, that the valve seats would gum up quicker than in actual practice, and the meters are driven at such a higher rate, therefore, any gumming up or drying of valve seats would show more trouble, but we have demonstrated to our satisfaction that that is one of the most important points ahead of us to work on. We have several mechanisms out for oiling the valve arms and seats, but none of them is practicable. They work and show absolute results but are not practicable. We are trying to get something that is practicable - that can be used with satisfaction, and that will neither cost very much nor require much maintenance. Dipping diaphragms, I believe has, to a very large extent, overcome the difficulty with bleached diaphragms. Now, fortunately, we do not have such a large percentage of these. For the 3 years that we have kept record of the causes of non-registering meters—and I am sorry I have not that record with me—the number of the latter caused by diaphragm troubles is so insignificant that you might eliminate it and your record would not be seriously affected; but the number of non-registering meters caused by valve arms and valves sticking, and troubles in the top of the meter, form a large percentage of the total causes of non-registration. The record surprised me very much the first year that we kept it, and unless Mr. Spangenberg has actually kept such a record, and can say definitely that, in his experience, such is not the case, I would simply say that he was in the same position that I was before keeping that record, when I believed that serious troubles with meters were usually caused by diaphragms. We always supposed that, until we kept actual track of what the trouble was that caused the meter to stop registering in every case. As far as the electrolysis theory advanced by Mr. Dickey is concerned, I feel with Mr. Spangenberg that it is probably something else. I never laid that trouble to the cause he mentioned, and do not quite see how it could in most cases be possible for electrolysis to affect the case of a meter.

Mr. C. F. Asendorf—Why is it that you find a practically new meter with probably a hole or two in the bottom or in the backplate, the other part of the meter being all sound, if the trouble is not due to electrolysis?

Mr. Brown - It is due to the condensation of moisture on it.

Mr. Spangenberg—Replying to Mr. Brown, I would like to say that I did keep such a record, and the difference in his experience and mine is probably due to the different kind of gas that passed through the meters, also probably to the difference in the make of meter.

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The Vice-President - In connection with that I would say, Mr. Spangenberg, that approximately one-half of our gas is coke oven gas, with benzole enrichment.

Mr. E. G. Pratt - There is not very much that I can add to the paper, for it seems to me Mr. Dickey covered the subject very carefully. It goes without saying that the larger companies pay all the attention to meters that Mr. Dickey mentioned in his paper, and there have been a great many good papers recently upon the same subject - one that was presented at the Illinois meeting was particularly good. It is the smaller companies that I imagine should pay more attention to such papers as that by Mr. Dickey, and probably a good many of the smaller companies - I presume a majority of them - must teach to a great extent the importance of the care of their meters, more especially the regular testing of meters, and the features that Mr. Dickey brought out in his paper, such as the handling of meters, their carting back and forth from the shop to the place of setting, and from the place of setting back to the shop, etc., are important ones. The larger companies have not very much to learn probably in the matter of handling meters, but I think the small ones have.

Mr. J. P. Eastman - I think one matter that Mr. Dickey did not cover fully is the position in which a small company which has only a few meters in the shop at a time is placed. You take a meter in the shop and oil the diaphragm. If that meter go to the prover too quickly after it has been oiled, the tangent of adjustment of the valve will have to be changed, and in a week or two afterwards the meter will be off about 2 per cent. Of course in large shops the meters have plenty of time to stand after being oiled, so that they come out all right, but in small works, with only 10 to 20 meters to work on, they will fix them all up in 2 days and put them onto the prover, only to find that the oil seems to run out of the diaphragm more or less, and the meter does not register as accurately as it should.

Mr. Douglas—The suggestion that, when a meter comes in, it be put upon a pilot test is a very good one; I mean for small companies that do not even have provers. A meter comes in and the question is, will it stand the pilot test? If it does not stand a pilot test there is something the matter with it, but if it does stand the test it is presumably all right. The test is very simple. Just put the meter on and see if it will register. That is a valuable suggestion. If with 100 meters each will stand the pilot test, all are presumably in pretty good shape, are they not?

Mr. Brown—Yes.

Mr. Douglas - How many of us have been doing that? We bring in the meter and send it out again without examination; that is bad for the company and bad for everybody. I think it a most practical suggestion for a man in a small works without any other device—he can surely do that.

Mr. E. G. Cowdery - I do not think of anything that I can add of interest to the subject, except possibly this: Mr. Spangenberg seems to favor the testing of a meter with air, whereas Mr. Brown and Mr. Dickey favor testing with gas. I do not see any difficulty whatever in the testing of a meter with gas, although, of course, it is more inconvenient. It seems to me the diaphragm of the meter is its delicate and vital part, and we know very well that it is easily changeable in its conditions, according to the varying amounts or kinds of oil it contains perhaps; and it seems reasonable to me that the test of the meter should be made under as nearly as possible the actual conditions that it is used in when registering the consumer's supply, and I cannot believe but you do get a varying condition when testing that meter with air over what you would if you tested it with gas under exactly the conditions it was when it was measuring gas. It seems to me it is a very strong point.

The Vice-President—My early education in the gas business was under Mr. Cowdery, as you all know, and I presume I absorbed some of his ideas upon the question of testing meters. I always felt they should be tested, as Mr. Cowdery says, under the same conditions under which they are used, as nearly as possible, and it seems to me it is a question that ought to be pretty thoroughly threshed out. Mr. Doherty, what do you think about it?

Mr. H. L. Doherty—I have not very decided opinions on the subject, and against two such experts as Mr. Brown and Mr. Spangenberg, I would hesitate to express an opinion. I have been trying to get them into a fight by which we could be both amused and profited.

The Vice-President—That's the idea I had when I called on you. [Laughter.] We should like to hear Prof. Burgess' views on that subject.

Prof. Burgess—I have had a very limited experience. We tested the same meters in both air and gas and found no difference in the results. There seems to be a good deal of logic in the suggestion that gas should be used, for if the diaphragm is exposed to the air a long enough time, it will change its condition and change its registration. You will certainly be safe in using gas and will likely eliminate certain difficulties that you encounter when you use air.

Mr. Kimball—We have recently been going over our meters and found a strange condition of affairs; that is, the older meters that have been in some 3 or 4 years show a smaller percentage of inaccuracy than our new meters. It was a surprise to us when we brought in the older meters to test and compare them. Perhaps the manufacturers are not putting the same oil in the diaphragm of the new meters as they formerly did.

Mr. Cowdery—In the last few years of observation it has been strongly impressed upon me that the greatest variation in a measure ment of the meter, which means probably the greatest variation in the condition of the diaphragm, took place in the first 6 months that a meter was put into action. After it has been in action 6 months more dependence can be placed on it than before that time.

Mr. Kimball—Such was our experience. We are finding that the new ones that have been out but a short time are not as accurate as the old ones.

The Vice-President—Did you notice any difference as to whether those new meters had been passing large quantities of gas?

Mr. Kimball—No; I have not gone into it to that extent. We were running it more on the basis of time. When first received they ran all right, but when out 6 months they beeame less reliable.

Mr. Doherty—One thing that I overlooked is Mr. Dickey's opinion that electrolysis takes place at the meter. I think we can dismiss that, because I do not see how you could have electrolytic action under any meter condition that I can imagine. For electrolytic action you need a current passing from the meter, and you need the metal of the meter in direct contact with an electrolyte. It is my opinion that any of the electrolytes we find in any ordinary natural condition have a counter-electromotive force of not less than 1.7 volts. I think all gas men are inclined to attach too much importance to the question of electrolysis, and I think they often explain oxidation by attributing it to electrolysis, when, if they would study the conditions under which electrolysis takes place, they could often remove difficulties from which they suffer, both in service pipe mains and other parts of their apparatus, and while that is not exactly pertinent to meters, I think the general error of the gas fraternity is to attribute too many things to electrolytic action.

Mr. Rice—I should like to speak of an experience we have had recently with one type of meter in trouble from corrosion of the valve guide rod. These meters had been in service but a very short time, in some cases less than a month. On taking them down we found corrosion had taken place in the rod, and the rod in some cases had increased in size to twice its diameter. Of course these meters became at once non-registering. Naturally we looked into the gas at once, to see what impurities we had. We did not find anything abnormal. The ammonia was extremely low and the total sulphur was all right; but on taking up the way these rods were manufactured we found that they were made of Tobin bronze, covered with tin. On examining the tin coating under the microscope, we found that it was not perfect, and we put it up to the manufacturer whether in his opinion this was not possibly a galvanic action set up between these three dissimilar metals. He agreed that it was, and has, I believe, stopped this tin coating. One reason for our belief in that was that we scraped a number of these rods clear of the tin coating and put them out just as plain Tobin bronze rods, in exactly the localities where we had had the corrosion, and no corrosion ensued. Therefore, if this experience is borne out by future experience, or the experience of others, it is a very important matter, in case rods of one metal are coated by another for the supposed prevention of corrosion, that we know the coatings must be perfect and remain so.

[Motion was made thanking Mr. Dickey for the preparation of an excellent paper and thanking Mr. Asendorf for reading it.]

### An Apology.

The Vice-President—I would like to apologize to you for my neglect in not extending to you yesterday an invitation to visit our meter shops and works; but I hope you took the liberty of going to either place without the invitation; but please remember that you have it now, and we should be glad to have you go to either place at your pleasure and also to the office. The Nominating Committee has handed in its report.

### Report of Nominating Committee.

Gentlemen: Your Nominating Committee begs leave to recommend the following officers for the ensuing year:

*President.*—David Douglas, Eau Claire.
*Vice-President.*—William Wallen, Oshkosh.
*Secretary-Treasurer.*—Henry H. Hyde, Racine.
*Representative of Wisconsin Gas Association on Directorate of American Gas Institute.*—S. J. Glass, Milwaukee.

Mr. H. L. Doherty assumed the Chair.

### Election of Officers.

On motion, the Secretary was instructed to cast the ballot of the Association for the gentlemen selected by the Nominating Committee.

The Secretary—I cast the ballot of the Association for candidates whose names appear on this report of the Committee, and declare that these gentlemen have a majority of the votes cast.

The Chairman—I hereby declare that the respective candidates are duly elected to their offices for the ensuing year. [Applause.]

Mr. Glass took the Chair and said: We should like to hear from Mr. Douglas.

Mr. Douglas—I thank you. I don't know that I have anything more to say. The position is a highly honorable one, and, as I understand, a very difficult one to fulfil; but I will do my best to meet you a year from now, or at whatever date is set, and I hope you will be able to have as large an attendance and as interesting a meeting as we are having at this time. I thank you. [Applause.]

### Next Place for Meeting.

The Vice-President—The Committee on Place of Next Meeting respectfully recommends that the next annual meeting of the Association be held in Milwaukee. [On motion of Mr. Doherty the report was adopted.]

Mr. Kimball—I do not know what the reason is for putting off the meeting until as late a date as was done this time. Is the matter left to the Executive Committee, or how is that done? I would suggest that the meeting be held a little earlier next year than this year.

The Vice-President—Do you wish to put that in the form of a motion?

Mr. Kimball—I do not know just how that is handled. I have not any definite date in mind, but would like to hear what the objections are to having it earlier.

The Vice-President—The Executive Committee deemed it advisable to hold a convention at a later date than February, on account of the frequently inclement weather at that time; in fact, the Committee presented the matter to the convention, and the vote was in favor of holding the convention in May. The vote was: May, 13; March, 7; April, 1.

Mr. Kimball—The total vote is rather small.

The Vice-President—I stated in the convention a year ago that if the meetings were to be held in Milwaukee it made little difference to our representatives as to the time of the year that the meeting was held, and it was a subject to be settled by the members from outlying points. That is the reason, I think, why the vote seemed so small in comparison with the number of members. The Secretary, who has had some sketches prepared for a badge for the Association, would like to submit them to the members and get their ideas as to what should be done in that line. Whether to have additional sketches made and something worked up or to drop it. I will pass these around, then if you think it would be proper to go on with the subject we will have a committee appointed to take it into consideration.

### A Resolution in Connection with the National Comeercial Gas Association.

Mr. Pratt—I wish to offer the following:

*Resolved*, That this Association expresses its appreciation of the action of the National Commercial Gas Association in deciding to hold its next annual convention and exhibition in the West, and that we,

a testing medium as the gas would, and be far cheaper and safer. Another point that Mr. Dickey mentions is electrolysis of the back and bottom of the meter case. That is new to me. It may be so, but I am rather inclined to believe the pitting came from moisture.

Mr. Brown—I am surprised to hear Mr. Spangenberg say that it is impracticable to test with gas, also that it is dangerous to test with it. There may have been accidents come from it, and it may have been that he has found some difficulty in its use, but so far as I know with our experience here, we have never found any difficulty in testing with gas, and we considered we got better results than through testing with air. The increase in expense has been so immaterial that we would not consider it an argument pro or con. We never had an accident of any character whatever traceable to the use of gas in testing. I am surprised also at his statement that the valves and mechanisms of the meter show such a small percentage of trouble that they can be ignored. As a matter of fact, we have had more trouble with the valves and valve mechanism than with all the diaphragms put together, as far as smoothness of operation and reliability are concerned. We have demonstrated to our complete satisfaction that an oiling system for the valves will allow us to put through a 5-light meter on our test lines, more than 5 times the average total passage which a 5-light meter handles in a 4-year term of life, and show perfect proof at the end, while the same test, without proper oiling of the valve seats and valve mechanism, will not show even the full complement which we might consider as the average passage of a 5-light meter in 4 years, before it would show trouble. Of course, we would expect on our test lines, where the gas is warmer and drier than it would be found in average conditions in a residence, for instance, that the valve seats would gum up quicker than in actual practice, and the meters are driven at such a higher rate, therefore, any gumming up or drying of valve seats would show more trouble, but we have demonstrated to our satisfaction that that is one of the most important points ahead of us to work on. We have several mechanisms out for oiling the valve arms and seats, but none of them is practicable. They work and show absolute results but are not practicable. We are trying to get something that is practicable - that can be used with satisfaction, and that will neither cost very much nor require much maintenance. Dipping diaphragms, I believe has, to a very large extent, overcome the difficulty with bleached diaphragms. Now, fortunately, we do not have such a large percentage of these. For the 3 years that we have kept record of the causes of non-registering meters—and I am sorry I have not that record with me—the number of the latter caused by diaphragm troubles is so insignificant that you might eliminate it and your record would not be seriously affected; but the number of non-registering meters caused by valve arms and valves sticking, and troubles in the top of the meter, form a large percentage of the total causes of non-registration. The record surprised me very much the first year that we kept it, and unless Mr. Spangenberg has actually kept such a record, and can say definitely that, in his experience, such is not the case, I would simply say that he was in the same position that I was before keeping that record, when I believed that serious troubles with meters were usually caused by diaphragms. We always supposed that, until we kept actual track of what the trouble was that caused the meter to stop registering in every case. As far as the electrolysis theory advanced by Mr. Dickey is concerned, I feel with Mr. Spangenberg that it is probably something else. I never laid that trouble to the cause he mentioned, and do not quite see how it could in most cases be possible for electrolysis to affect the case of a meter.

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Mr. E. G. Pratt - There is not very much that I can add to the paper, for it seems to me Mr. Dickey covered the subject very carefully. It goes without saying that the larger companies pay all the attention to meters that Mr. Dickey mentioned in his paper, and there have been a great many good papers recently upon the same subject - one that was presented at the Illinois meeting was particularly good. It is the smaller companies that I imagine should pay more attention to such papers as that by Mr. Dickey, and probably a good many of the smaller companies - I presume a majority of them - must teach to a great extent the importance of the care of their meters, more especially the regular testing of meters, and the features that Mr. Dickey brought out in his paper, such as the handling of meters, their carting back and forth from the shop to the place of setting, and from the place of setting back to the shop, etc., are important ones. The larger companies have not very much to learn probably in the matter of handling meters, but I think the small ones have.

Mr. J. P. Eastman - I think one matter that Mr. Dickey did not cover fully is the position in which a small company which has only a few meters in the shop at a time is placed. You take a meter in the shop and oil the diaphragm. If that meter go to the prover too quickly after it has been oiled, the tangent of adjustment of the valve will have to be changed, and in a week or two afterwards the meter will be off about 2 per cent. Of course in large shops the meters have plenty of time to stand after being oiled, so that they come out all right, but in small works, with only 10 to 20 meters to work on, they will fix them all up in 2 days and put them onto the prover, only to find that the oil seems to run out of the diaphragm more or less, and the meter does not register as accurately as it should.

Mr. Douglas—The suggestion that, when a meter comes in, it be put upon a pilot test is a very good one; I mean for small companies that do not even have provers. A meter comes in and the question is, will it stand the pilot test? If it does not stand a pilot test there is something the matter with it, but if it does stand the test it is presumably all right. The test is very simple. Just put the meter on and see if it will register. That is a valuable suggestion. If with 100 meters each will stand the pilot test, all are presumably in pretty good shape, are they not?

Mr. Brown—Yes.

Mr. Douglas - How many of us have been doing that? We bring in the meter and send it out again without examination; that is bad for the company and bad for everybody. I think it a most practical suggestion for a man in a small works without any other device—he can surely do that.

Mr. E. G. Cowdery - I do not think of anything that I can add of interest to the subject, except possibly this: Mr. Spangenberg seems to favor the testing of a meter with air, whereas Mr. Brown and Mr. Dickey favor testing with gas. I do not see any difficulty whatever in the testing of a meter with gas, although, of course, it is more inconvenient. It seems to me the diaphragm of the meter is its delicate and vital part, and we know very well that it is easily changeable in its conditions, according to the varying amounts or kinds of oil it contains perhaps; and it seems reasonable to me that the test of the meter should be made under as nearly as possible the actual conditions that it is used in when registering the consumer's supply, and I cannot believe but you do get a varying condition when testing that meter with air over what you would if you tested it with gas under exactly the conditions it was when it was measuring gas. It seems to me it is a very strong point.

The Vice-President—My early education in the gas business was under Mr. Cowdery, as you all know, and I presume I absorbed some of his ideas upon the question of testing meters. I always felt they should be tested, as Mr. Cowdery says, under the same conditions under which they are used, as nearly as possible, and it seems to me it is a question that ought to be pretty thoroughly threshed out. Mr. Doherty, what do you think about it?

Mr. H. L. Doherty—I have not very decided opinions on the subject, and against two such experts as Mr. Brown and Mr. Spangenberg, I would hesitate to express an opinion. I have been trying to get them into a fight by which we could be both amused and profited.

The Vice-President—That's the idea I had when I called on you. [Laughter.] We should like to hear Prof. Burgess' views on that subject.

Prof. Burgess—I have had a very limited experience. We tested the same meters in both air and gas and found no difference in the results. There seems to be a good deal of logic in the suggestion that gas should be used, for if the diaphragm is exposed to the air a long enough time, it will change its condition and change its registration. You will certainly be safe in using gas and will likely eliminate certain difficulties that you encounter when you use air.

Mr. Kimball—We have recently been going over our meters and found a strange condition of affairs; that is, the older meters that have been in some 3 or 4 years show a smaller percentage of inaccuracy than our new meters. It was a surprise to us when we brought in the older meters to test and compare them. Perhaps the manufacturers are not putting the same oil in the diaphragm of the new meters as they formerly did.

Mr. Cowdery—In the last few years of observation it has been strongly impressed upon me that the greatest variation in a measurement of the meter, which means probably the greatest variation in the condition of the diaphragm, took place in the first 6 months that a meter was put into action. After it has been in action 6 months more dependence can be placed on it than before that time.

Mr. Kimball—Such was our experience. We are finding that the new ones that have been out but a short time are not as accurate as the old ones.

The Vice-President—Did you notice any difference as to whether those new meters had been passing large quantities of gas?

Mr. Kimball—No; I have not gone into it to that extent. We were running it more on the basis of time. When first received they ran all right, but when out 6 months they beeame less reliable.

Mr. Doherty—One thing that I overlooked is Mr. Dickey's opinion that electrolysis takes place at the meter. I think we can dismiss that, because I do not see how you could have electrolytic action under any meter condition that I can imagine. For electrolytic action you need a current passing from the meter, and you need the metal of the meter in direct contact with an electrolyte. It is my opinion that any of the electrolytes we find in any ordinary natural condition have a counter-electromotive force of not less than 1.7 volts. I think all gas men are inclined to attach too much importance to the question of electrolysis, and I think they often explain oxidation by attributing it to electrolysis, when, if they would study the conditions under which electrolysis takes place, they could often remove difficulties from which they suffer, both in service pipe mains and other parts of their apparatus, and while that is not exactly pertinent to meters, I think the general error of the gas fraternity is to attribute too many things to electrolytic action.

Mr. Rice—I should like to speak of an experience we have had recently with one type of meter in trouble from corrosion of the valve guide rod. These meters had been in service but a very short time, in some cases less than a month. On taking them down we found corrosion had taken place in the rod, and the rod in some cases had increased in size to twice its diameter. Of course these meters became at once non-registering. Naturally we looked into the gas at once, to see what impurities we had. We did not find anything abnormal. The ammonia was extremely low and the total sulphur was all right; but on taking up the way these rods were manufactured we found that they were made of Tobin bronze, covered with tin. On examining the tin coating under the microscope, we found that it was not perfect, and we put it up to the manufacturer whether in his opinion this was not possibly a galvanic action set up between these three dissimilar metals. He agreed that it was, and has, I believe, stopped this tin coating. One reason for our belief in that was that we scraped a number of these rods clear of the tin coating and put them out just as plain Tobin bronze rods, in exactly the localities where we had had the corrosion, and no corrosion ensued. Therefore, if this experience is borne out by future experience, or the experience of others, it is a very important matter, in case rods of one metal are coated by another for the supposed prevention of corrosion, that we know the coatings must be perfect and remain so.

[Motion was made thanking Mr. Dickey for the preparation of an excellent paper and thanking Mr. Asendorf for reading it.]

### An Apology.

The Vice-President—I would like to apologize to you for my neglect in not extending to you yesterday an invitation to visit our meter shops and works; but I hope you took the liberty of going to either place without the invitation; but please remember that you have it now, and we should be glad to have you go to either place at your pleasure and also to the office. The Nominating Committee has handed in its report.

### Report of Nominating Committee.

Gentlemen: Your Nominating Committee begs leave to recommend the following officers for the ensuing year:

*President.*—David Douglas, Eau Claire.
*Vice-President.*—William Wallen, Oshkosh.
*Secretary-Treasurer.*—Henry H. Hyde, Racine.
*Representative of Wisconsin Gas Association on Directorate of American Gas Institute.*—S. J. Glass, Milwaukee.

Mr. H. L. Doherty assumed the Chair.

### Election of Officers.

On motion, the Secretary was instructed to cast the ballot of the Association for the gentlemen selected by the Nominating Committee.

The Secretary—I cast the ballot of the Association for candidates whose names appear on this report of the Committee, and declare that these gentlemen have a majority of the votes cast.

The Chairman—I hereby declare that the respective candidates are duly elected to their offices for the ensuing year. [Applause.]

Mr. Glass took the Chair and said: We should like to hear from Mr. Douglas.

Mr. Douglas—I thank you. I don't know that I have anything more to say. The position is a highly honorable one, and, as I understand, a very difficult one to fulfil; but I will do my best to meet you a year from now, or at whatever date is set, and I hope you will be able to have as large an attendance and as interesting a meeting as we are having at this time. I thank you. [Applause.]

### Next Place for Meeting.

The Vice-President—The Committee on Place of Next Meeting respectfully recommends that the next annual meeting of the Association be held in Milwaukee. [On motion of Mr. Doherty the report was adopted.]

Mr. Kimball—I do not know what the reason is for putting off the meeting until as late a date as was done this time. Is the matter left to the Executive Committee, or how is that done? I would suggest that the meeting be held a little earlier next year than this year.

The Vice-President—Do you wish to put that in the form of a motion?

Mr. Kimball—I do not know just how that is handled. I have not any definite date in mind, but would like to hear what the objections are to having it earlier.

The Vice-President—The Executive Committee deemed it advisable to hold a convention at a later date than February, on account of the frequently inclement weather at that time; in fact, the Committee presented the matter to the convention, and the vote was in favor of holding the convention in May. The vote was: May, 13; March, 7; April, 1.

Mr. Kimball—The total vote is rather small.

The Vice-President—I stated in the convention a year ago that if the meetings were to be held in Milwaukee it made little difference to our representatives as to the time of the year that the meeting was held, and it was a subject to be settled by the members from outlying points. That is the reason, I think, why the vote seemed so small in comparison with the number of members. The Secretary, who has had some sketches prepared for a badge for the Association, would like to submit them to the members and get their ideas as to what should be done in that line. Whether to have additional sketches made and something worked up or to drop it. I will pass these around, then if you think it would be proper to go on with the subject we will have a committee appointed to take it into consideration.

### A Resolution in Connection with the National Comeercial Gas Association.

Mr. Pratt—I wish to offer the following:

*Resolved*, That this Association expresses its appreciation of the action of the National Commercial Gas Association in deciding to hold its next annual convention and exhibition in the West, and that we,

as an Association, second the suggestion embodied in the invitation extended by the Illinois Gas Association. Namely, to make Chicago the place, and December 8th, 9th and 10th the date, and that the Secretary be instructed to send a written copy of it to the Secretary of the National Commercial Gas Association.

I move the adoption of the resolution. [Seconded and adopted.]

[To be Continued.]

[No. V.]

## Review of the Twenty-third Annual Report, Board of Gas and Electric Light Commissioners, Commonwealth of Massachusetts.

[Prepared for the JOURNAL by MR. H. THURSTON OWENS.]

*Meters.*—The figures regarding meters are given in great detail. The number in use, June 30, 1907, was 364,700, an increase of 31,128 over the previous year. Prepayment meters represent two-thirds of the increase, and one-quarter of the total in use.

*Gas Stoves.*—The figures presented covering the number of gas stoves in use are designated by the Commission as "necessarily estimates," and some of them might be termed "unnecessarily wide estimates," if one were to judge from the figures in the table following:

| Company. | Populations. | Meters. | Gas Stoves. | Population. | |
|---|---|---|---|---|---|
| | | | | Per Meter. | Per Gas Stove |
| Boston | 534,553 | 117,948 | 49,470 | 4.5 | 10.8 |
| Worcester | 128,135 | 16,674 | 9,500 | 7.6 | 13.4 |
| Lowell | 107,095 | 18,672 | 8,457 | 5.7 | 12.6 |
| Fall River | 105,762 | 17,704 | 18,353 | 5.9 | 5.7 |
| Lynn | 88,436 | 18,043 | 21,045 | 4.9 | 4.2 |
| Waltham | 26,282 | 3,343 | 2,218 | 7.9 | 11.8 |

There are more stoves than meters in two of these cities, and the figures given indicate that there is a stove for every family in each of the places referred to.

Comparing the "estimates" of gas stoves in each city, given in the report for June 30, 1907, with that of the previous year, we find that two cities show a loss—Leominster and Southbridge; two report the same number—Boston and Stoneham. All of the others report increases, the most notable being as follows: Malden, 2,166 to 4,587; Norwood, 7 to 167; and Quincy, 275 to 625.

The report includes tables which give an analysis, on the unit basis of 1,000 feet of gas, of the income, expenditures and surplus earnings of all of the gas companies making or selling more than 100 million feet of gas during the year.

There are 16 of these companies, and the total income per 1,000 sold ranges from $0.8075, at Boston, to $1.3803 at Salem. The amount received in Boston for residuals was $37,834.91, which was equal to $1.35 per ton of coal carbonized, or 16.55 per cent. of cost of coal. In Cambridge the amount was $65,092.75, or $1.87 per ton of coal, and 49.10 per cent. of cost of coal.

The largest amount received for residuals was in the city of Lowell, where the results were as follows: Amount received for residuals $95,275.19; per ton of coal carbonized, $2.77; percentage of cost of coal, 60.19. The showing in Lowell as to residuals is better than that of the London, England, companies by approximately 20 per cent.

The total cost of manufacture among these 16 companies ranged from $0.26875 per 1,000 made, at Fall River, to $0.76162, at Newton, while the net cost in holder (less residuals sold) per 1,000 made, ranged from $0.26856, at Fall River, to $0.58583 at Newton. Lowell stands tenth on the list of "Total cost of manufacture per 1,000 made," but third of "net cost in holder" after residuals sold have been deducted, the figures being $0.48856 and $0.32347, respectively. Boston stands seventh.

In 7 of the 16 companies the "total net cost of gas made and purchased in holder per 1,000 sold" was less than 40 cents.

In 7 of the 16 companies the "total cost of distribution per 1,000 sold" was less than 10 cents; the lowest being Haverhill, at $0.06674, and the highest Newton, at $0.24861. Boston standing seventh.

The "total cost of manufacture, purchase and distribution of gas, less residuals per 1,000 sold," was less than 60 cents in four companies. Lynn leading, with $0.53215, Boston standing third, with $0.55599, and Salem last, the cost being $0.87133. A comparative statement covering the operations in these three companies is found in Table I.

TABLE I.—*Showing Conditions in the Largest Company—Boston; the Company with the Lowest Total Cost—Lynn, and the Highest—Salem, of the Companies Making or Selling More than 100 Million Feet During the Year.*

| Income. | Lynn. | Boston. | Salem. |
|---|---|---|---|
| Income per 1,000 sold | $0.9208 | $0.8075 | $1.3803 |
| EXPENSES OF MANUFACTURE. | | | |
| Cost coal per 1,000 made | .15728 | .10232 | .33121 |
| " enrichers per 1,000 made | .09175 | .14521 | .03494 |
| " purifiers " " | .00251 | .02896 | .03339 |
| " water " " | .00284 | .00490 | .00360 |
| " wages " " | .04717 | .07696 | .11585 |
| " repairs " " | .05956 | .03556 | .09702 |
| Total cost of manufacture per 1,000 made (less residuals) | .36112 | .39391 | .61601 |
| Net cost per 1,000 made | .28668 | .3770 | .50222 |
| Gas purchased per 1,000 | .... | .2292 | .... |
| Total net cost in holder per 1,000 sold | .31009 | .31771 | .50222 |
| EXPENSES OF DISTRIBUTION. | | | |
| Cost wages per 1,000 sold | .02573 | .03875 | .02463 |
| Cost repairs of mains and services per 1,000 sold | .05437 | .02560 | .06177 |
| Cost repairs of meters per 1,000 sold | .03990 | .01561 | .02144 |
| Cost tools and appliances per 1,000 sold | .00749 | .01220 | .01788 |
| Cost gas stoves per 1,000 sold | .02189 | .00668 | .02263 |
| Total cost of distribution per 1,000 sold | .14938 | .09885 | .14836 |
| OPERATING EXPENSES. | | | |
| Cost office expenses per 1,000 sold | .02437 | .06181 | .09293 |
| Cost taxes per 1,000 sold | .03275 | .06699 | .11054 |
| Cost miscellaneous expenses per 1,000 sold | .01556 | .01062 | .01728 |
| Total cost of manufacture, purchase and distribution of gas less residuals, per 1,000 sold | .53215 | .55599 | .87133 |
| Average price received per 1,000 sold | .84 | .798 | 1.20 |
| Total sales 1,000 feet | 477,938 | 4,215,471 | 111,327 |
| Sales per consumer | 26,486 | 30,781 | 16,648 |

*Public Lighting.*—The information given regarding street lighting is somewhat meager, and this is especially true as to gas lighting. The general conditions may be summed up as follows:

TABLE II.—*Style of Illuminant.*

| | | | | | |
|---|---|---|---|---|---|
| Private plants supply gas | acetylene | " | 6 | " | " |
| " " " | electric | " | 150 | " | " |
| Municipal " " | " | " | 23 | " | " |

TABLE III.—*Lighting Schedule.*

| | | | |
|---|---|---|---|
| Private plant | gas and acetylene (not given). | | |
| " " | electric, all night | 29 | cities and towns. |
| " " " | part all night and part half night | 11 | " " " |
| " " " | half night | 110 | " " " |
| Municipal " | all night | 7 | " " " |
| " " " | half night | 16 | " " " |

Of the 32 cities using gas lamps there was an increase in 22 and a decrease in 2, the total net increase being 956 lamps, leaving 17,258 burning June 30, 1907. Over one-half of the gas lamps in the State are in the city of Boston, where they number 10,182, or 1 lamp per 58 inhabitants; in the State the ratio is 1 gas lamp to every 173 inhabitants.

The fact that street lighting by gas is not considered particularly valuable business is probably the principal reason for the poor showing made by the gas companies in this regard. One feature must not be overlooked, and that is the advertising value. There is no question that advertising pays, and we have before us a very telling example in the present agitation over the tungsten lamp.

Sign Lighting by Gas.

We are indebted to Mr. A. H. Kalka, of Salt Lake City, Utah, for a proof from which the accompanying illustration was made. The examples given are all in working order in Salt Lake City, and furnish composite proof that gas lighted signs are no longer negative; to the contrary, are directly positive.

## Attention to Consumers.

[Prepared for the Fourth Annual Meeting, the Iowa District Gas Association, by MR. THOMAS CRAWFORD, Clinton, Ia.]

The most important part of the gas company's business, before soliciting and inviting any new business, is to see that the consumers already being served have the best possible service and the most courteous treatment obtainable. Nothing succeeds like success. If your customers are well pleased with the gas service and treatment they are receiving, they will help in the building up of your business, and *vice versa*. Most complaints are, as all persons actively engaged in gas industry know, sometimes the fault of the company, but more often the fault of the consumer. The most common troubles which cause complaints on the part of the customer are large bills, water in the service or in the meter, naphthaline, poor burners or mantles, and other troubles and misunderstandings too numerous to mention. Too much care cannot be exercised in the courteous treatment of the public. The employees of your company must be courteous, no matter what the seeming cause of disagreement may be. Nothing makes the consumers or the public feel more hatred to a corporation than cold, indifferent or insulting treatment from its employees. Very many of the complaints of the consumer are either trivial or imaginary. We send out on complaints and find various troubles, some of which we can control, and others that are no fault of ours, which cause dissatisfaction or objections. Cheap mantles, hot plates, burners and appliances of all kinds are the causes of most of the troubles. The first thing the gas man must be sure of is that he has clean gas, free from sulphur, tar and naphthaline, with good pressure and candle power, large mains and services. Nothing smaller than 1¼-inch should be laid for a distance of over 50 feet, and nothing smaller than 1¼-inch should be laid in a business house of any kind.

I believe gas companies should sell all appliances for as little profit as possible, so as to allow the consumer to have the very best appliances and service at the minimum cost. A good method of handling complaints is as follows:

Have a complaint blank in duplicate; the duplicate can be used for filing. Have printed on the complaint blank, which is a piece of white paper about 4 inches wide and 7 inches long, service number, consumer's name, address, name of party taking complaint, time complaint was taken, date, cause and remedy, either applied on the spot or attention called to some other department for repairs, and name of fitter on the work. Have a blank space left for signature of the complainant when work is done in a satisfactory manner. This eliminates the often heard statement that complaints are reported and not taken care of. The signed statement can be produced, which is a knockdown argument for the gas company. If the cause of the complaint is condensation in the meter, have the meter moved where condensation cannot form, or place drips on each side of the meter. If the complaint is from frost, enlarge the pipe or move the appliance, so that a repetition of this trouble will not occur, and so on with a number of other small defects, Nothing pleases a consumer so much as to have complaints properly taken care of. Send your fitter or service man, and make good and permanent repairs, not sparing expense to prevent a repetition of the trouble. Do not quibble with your consumer as to cost of repairs to give good service. If the trouble is due to the consumer's orders, or something beyond your control, have an understanding with him on the spot as to the cause, cost and effect. Have all employees capable of showing patrons the

proper way to adjust and clean stove burners, Welsbach burners, read their meters, and see that all of your employees have proper badges or uniforms. Have a card index system, and from the complaint blanks file all visits to the consumers' premises, except the meter statement. We have had the complaint that the meter was not properly read, or even was not read at all. One way we can combat this argument is to have the meter book made up of perforated sheets, each sheet divided by 12 perforations, so that each month's statement can be torn from the leaf before the book is again given to the meter reader. Using this system, the meter reader cannot guess at the consumption of the meter, as he has nothing to guide him but the statement itself.

Have printed on the backs of your bills duplicate indexes of the meter, so that your consumer can mark the position of the hands on the dial and bring them into the office to verify his reading or comparison. Prompt and careful attention to complaints on leaks is most essential, for careless attention to this feature will eventually prove disastrous to both consumer and company. Have printed in a conspicuous place, also in italics, "Report Leaks Promptly." The instantaneous water heater, or bath room water heater, comes in for its share of the complaints. A heater of this sort should not be connected to gas without a flue connection carrying the consumed by-products out of doors. City water has very often in solution minerals of various natures, which form scale inside the heater, and the water is naturally shut off. The gas is not properly adjusted and soot is deposited on the sides and tubes of the heater, which falls down into the water and discolors it. These conditions should be explained to your consumer and the remedy explained and applied. We are always glad to clean and adjust burners or any ranges for our customers, but only in extreme cases do we clean the dirt and filth which some consumers allow to form on their ranges.

Drips should be pumped at regular intervals, and if a service drip has to be installed (this should never be allowed unless absolutely necessary) see that it is pumped regularly. Have a printed drip sheet, and after your drip man has been over all drips, compare with previous sheet, and if any material increase in drip water is noted, locate the trouble at once and repair. Have a careful inspection every two years of all piping in houses, and inspect all cooking, heating, industrial and lighting appliances oftener.

Have all orders for material, no matter how small, signed by the party financially responsible for orders. There can then be no cause for objection at the time of settling the account. This is more satisfactory to the consumer and to the company and does away with a whole lot of bad feeling and misunderstanding when time for settlement comes. We have found that a great many of the complaints of large bills and large consumption are settled in a manner satisfactory to the consumer, by installing a prepayment meter, the consumer paying for his gas as he gets it, which makes him soon find out where his gas is being used. From our own experience this has been our best friend. We have had consumers who have $6 to $9 bills easily reconciled to the fact by the installing of the prepayment meter. He pays for his gas before he gets it; something tangible. He sees the hand on the prepayment dial move a certain space, when he puts his money in the meter, is under his control, and he is generally satisfied and lets his neighbor know that he has the gas company at his mercy, and the company is very willing that he should have, and we push the prepayment meter at every opportunity. The trouble most people have with the gas meter is, as they say, you own the meter, you have charge of it, the testing and installing of it, and we have to pay whatever you say. Teach them to read the meter, and if this does not satisfy them, talk prepayment. I venture to say that we have 250 consumers out of 3,400 whom we could not hold except with the prepayment meter. One-third of all our meters now installed are prepayment. The prepayment meter gets rid of the obnoxious and unreasonable kicker on discount day also. One man kicks and others near him hearing him, think they have a kick also, thus delaying settlements and making your office unpleasant to work in and to visit. Make your office surroundings pleasant. If your office help are pleasant and congenial the people will soon find it out and be pleasant and congenial also. Have your appliances connected and be ready at any time to show the method of handling any or all of them. Occasionally give them souvenirs, such as sand glass egg timers, thimbles, lead pencils, stove mats, etc., both for advertising and to create a liberal, rather than a selfish, impression.

In the care and installing of Humphrey arcs, be liberal in caring for them. If you maintain your arcs at a normal rental or maintenance charge, give the people liberal treatment in the way of mantles and the cleaning of glassware. If you have a customer who has a grievance on account of poor light or service, and after investigating the piping, meter and service pipe, you find the appliances faulty, and are satisfied that your part of the compact has been carried out, but he is not satisfied, give him a good Welsbach light, install it and adjust it. Nine times out of ten he will be satisfied. Have an established policy in all departments, but be flexible and liberal enough to strain a point for the "good of the cause." When an occasion arises in the extreme, put yourself in the consumer's place and look at the position through his eyes, if possible. Remember that you may have some faults, as well as your consumer, and treat his grievances accordingly. Do not promise your consumer anything in the way of bills or service unless you can deliver the goods.

## Three Methods of Tar Disposal.

[Prepared for the Fourth Annual Meeting, Iowa District Gas Association, by Mr. W. H. Taylor, Jr., Omaha, Neb.]

It is desired to call attention to three methods of tar disposal which require very little expense for equipment, preparation or in working up a market. There are many other ways to dispose of tar, but as they will require special plants or large expenditures for advertising, preparation, etc., they would not be profitable for the small gas works. The three to which attention is called require practically no outlay whatever for equipment, except that which every plant should have in the regular routine of gas manufacture. These are: Tar as a boiler fuel; tar as a generator fuel; tar for roadway purposes.

The only preparation of the tar required for each of these methods is that the water must be entirely eliminated from it. This is accomplished in water gas manufacture by means of tar separators, which consist of wooden boxes with overflow and underflow partitions arranged alternately, so that in traveling from one end of the box to the other the tar gradually settles out and is left in the bottom of the box, while the water passes out through the overflow to the hot well of the circulating system. In order that separators shall work to the best advantage the water and tar entering them should be hot; that is, they should be at a temperature of at least 150° F. To accomplish this requires that a circulating system be used, and the same water used in the washboxes over and over again, being pumped from the hot well to the washbox, passing out through the seal pots into the separators, and from there back to the hot well. Keeping the tar and water mixture hot until the separation is effected is the most important feature in successfully separating these liquids.

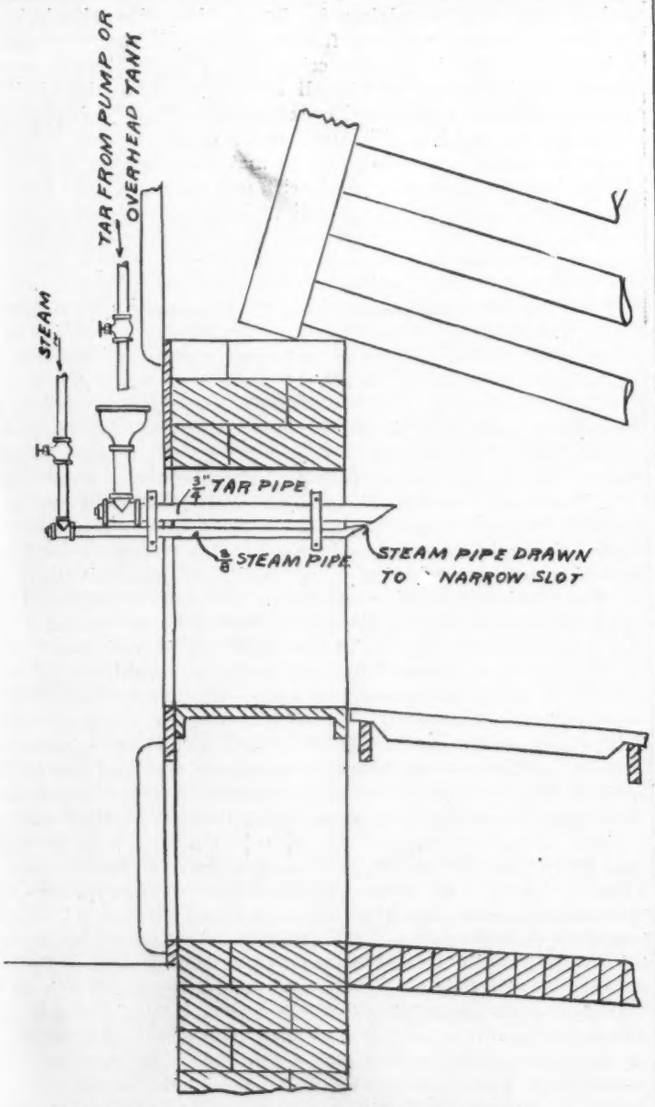
The tar is drawn off from time to time into a tar storage well from which it can be pumped for use or to other storage. Two of these separators in series will give much better results than the usual length of separator.

A still further refinement of the tar can be made if it is pumped from the tar well or storage into a condenser and allowed to settle there. If the gases passing through the condenser are at a temperature of from 160° to 180°, all the moisture will finally be evaporated, leaving an excellent quality of tar. After the above preparation it is ready for disposal.

*Tar as a Boiler Fuel.*—The proceedings of the various Gas Associations and the Gas Journals have covered this field very thoroughly, so that reference to them will furnish a considerable number of ways of burning and burners for tar. Almost every works devises a burner to suit its local conditions, but all of them operate on the same principle, that of a small steam jet impinging in the tar and spraying it in the boiler furnace. The features of a tar burner requiring attention are: Least quantity of steam used, elimination of small orifices and contractions that will easily plug up if some foreign substanee gets into the tar, ease of cleaning during operation, and a sight feed.

Fig. 1 shows a tar burner that has been in use at Omaha for some time and has proven satisfactory. With water gas tar the boilers should operate on from 1 to 1.2 gallons of tar per 1,000 feet of gas made, which would make the tar worth about 2.25 cents a gallon.

*Tar as a Generator Fuel.*—To use tar as a generator fuel offers a better opportunity for the disposal of this product than as a boiler fuel, and it is advisable to dispose of it in this way, or as much of it as possible, owing to the greater cost of generator fuel. It has been found that with oven coke 1 gallon of tar is equivalent to 8 or 9 pounds of generator fuel. There is a somewhat greater make of gas per run, and, while there are no definite figures at hand, tar has a beneficial effect on oil efficiencies. It has been found that about .35 gallon of tar per 1,000 feet of gas made is the most that can be used economically in the generators. Those interested in this subject should read a paper, read by Mr. George H. Waring, before the Western Gas Association, entitled "The Utilization of Tar in a Water Gas Machine."



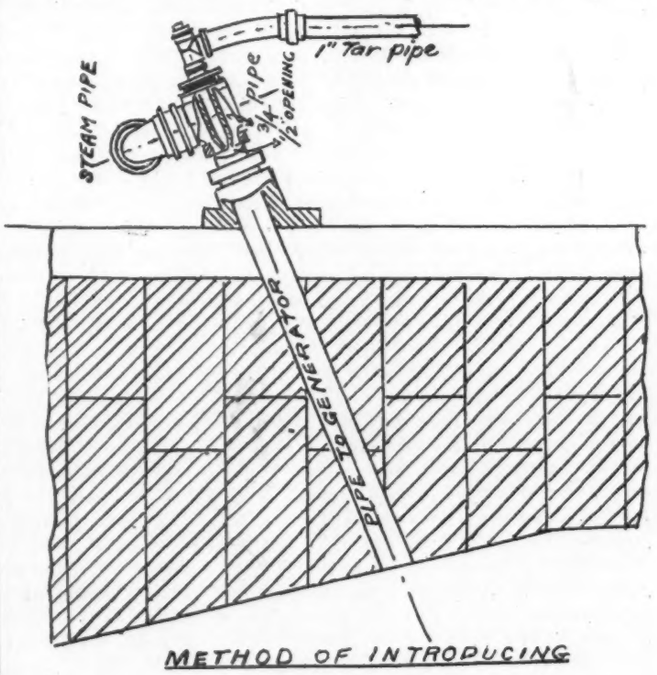

TAR BURNER FOR BOILER FURNACE.

Fig. 1.

In using tar in the generators the method of operating is as follows: Tar is pumped from the condenser or tar well by a pump located in the engine room and running continuously; from there it goes to a tar meter located on the operating floor where it is controlled by suitable valves handled by the gas maker. From the tar meter it goes to the top steam inlet of the generator, and on to the fire, where it is decomposed into lampblack and hydrogen. The lampblack is consumed on the next succeeding blow. The gas maker goes through the regular operation of putting on a down run and then turns on the tar. When the desired amount of tar has passed the meter, it is shut off and a steam purge line opened which cleans the tar from the line and prevents smoke from drippings during the blow, or when the coal hole door is open. There is usually a little smoke escaping around the coaling doors during the run, but with a little care this can be kept down to an amount that will not be objectionable. By scraping the doors daily there will be practically none at all. The gas makers at Omaha usually remove and scrape 3 doors in about 10 minutes time.

Fig. 2 illustrates the method of forcing the tar into the generators at Omaha. A still better method is to have an oil injector on the head of the generator and to spray tar as oil is sprayed into the carburetter.

*Tar on Roadways.*—This undoubtedly offers the best field for creating a local market for tar and a profitable one; but will require greater effort on the part of the manager. It will usually be necessary to make a free demonstration on a section of roadway or boulevard in order to show what an improvement can be and to convince the skeptic. In applying water gas tar to a roadway it is necessary that the roadway be shaped-up and perfectly dry. It is well to apply




METHOD OF INTRODUCING TAR INTO GENERATORS.

Fig. 2.

the tar only during bright, sunny days. One-half the roadway is first covered and allowed to dry before the other half is covered. It is applied cold and can be spread by a man with an ordinary sprinkling can, or by a tank wagon with a spray in the rear.

A road treated in this way will present a hard, dry surface, free from dust. The tar will also kill weeds and objectionable vegetation. It is advisable to treat a road with tar about twice a year. One gallon of tar will cover about 3 square yards of roadway on each application. This at a price of 6 cents a gallon for tar applied makes the unusually low cost of 2 cents per square yard; a price that will compete very favorably with the price charged for many of the preparations on the market and still leave the gas man a good price for his tar. With the three methods outlined above all the tar made at a works can be disposed of at a profit, and it will only be necessary to hold and store enough for fuel purposes for emergency use during strikes, etc.

Taking the make of tar per 1,000 feet of gas made as .7 of a gallon, we see that, by using it as boiler fuel, more tar could be disposed of than is made. By using it in the generators about half of the make of tar can be disposed of at a better price than can be derived from its use as boiler fuel. This method leaves one-half of the make to be disposed of which can be done on roadways, as boiler fuel or whatever miscellaneous ways may develop due to local conditions.

## The Delinquent Account.

[Prepared for the Fourth Annual Meeting, Iowa District Gas Association, by MR. A. W. BORDEN, Hastings, Neb.]

The subject of this paper is one which I am safe in saying is of vital interest to the man operating either a large or a small gas plant. As the gas business has witnessed a revolution in the last 8 or 10 years, inasmuch as the old ideas—one of the favorite maxims of which was, "dividends are produced in the retort house"—have given way to a broader reasoning which has resulted in bringing into his proper prominence the commercial gas man, just so surely do I believe the question in hand is one deserving of his study and attention. You may agree with me at the outset that no rule nor set code of rules can be employed in the successful coping with this "Disease of the ledger," but, on the other hand, it has at least been my experience that each individual account of this type necessitates its own peculiar treatment. A bad account, that has for some reason or other been allowed to run until it has assumed a size of considerable proportions, takes the form of a problem often difficult to solve successfully. There are some poor pay individuals whom it would be in-

finitely better to shut off, so-to-speak, in the outset, or first signs, of delinquency, and some slow pay consumers with whom such treatment would undoubtedly end in results most fatal or at least unpleasant. Just how to distinguish between these types is a study of human nature well worthy the effort of the manager, and, I repeat, one which will demand his personal attention unless, of course, his collectors are sufficiently conscientious of purpose and adequate to the occasion. Of course, conditions are varied in different communities, and there are some places where there is no competition, and the policy of "pay-or-quit" can be somewhat more rigidly enforced than in a place where competition is severe. I can only endeavor to set forth a few of the methods that have already been used is remedying as far as possible this condition.

Among a few of the types of the poor pay accounts, I will mention, first, the "professional dead beat," whose income is known to be of an uncertain nature, probably through lack, not of ability, but of absolute ambition, and whose living expenses are allowed to go on just the same, with the consequence that someone must suffer. After an account of this kind has run for some months you will find that this man has absolutely disregarded your collector by turning him away, time after time, with a good-natured excuse, and very likely has left unanswered your polite letters of request, until at last, when you are compelled to call upon him in person, he is the "friend" who puts his hand on your shoulder with a sincere "I appreciate your indulgence," and a plausible excuse for his state of delinquency, accompanied perhaps with a promise to pay at an early date, if indeed he does not even set a day on which he will call at your office. I have found this a class of delinquent consumer who will demand all the patience and care possible, and that, after a certain number of calls from the collector and the usual number of polite letters of request, a letter appealing to his better sense of reasoning and intelligence will often produce results, such as:

"My dear sir: We beg to call your attention to the fact that your account has run —— months and that the loss in discounts has already aggregated so much to you. We are sure that you will agree that we have been duly lenient in this matter, and that we are not unreasonable in requesting that this item be settled not later than ——date. Very truly yours, etc."

Such a letter bears no threatening aspect, nor is the tone one at which any person could take exception, yet in the case of the gas bill the absent alternative is not pleasant to contemplate, and there is, I think, a certain firmness in the style carrying unmistakable significance. There are many people with whom such a letter would be but a waste of paper and time, and with such ones a direct notification of the removal of the meter is the only remedy. We also have under this head the man who means well enough but never has the money. We have the man of ample means but no disposition to pay any bill that can be avoided. We have the moderately paid but extravagant employee of some large drygoods firm. We have to deal with the transient tenant who blows into town and is liable to blow out again with as little effort. Again, we have the man who is "naturally slow" and who would have no compunctions, indeed, on the contrary, would be a little bit proud of the fact if he could beat the gas company out of a bill, and is prevented from doing so only for fear of a possible discontinuance of his service and the consequent embarassment at home. There are far too many types to admit of enumeration, but each is distinctive to the degree of recognition and, of course, requires specific treatment. For the good of collection in general, I presume that the discount date plan would be difficult to improve upon, providing the discount feature is of a denomination sufficient to warrant interest on the part of the consumer, and, above all, providing the plan or rule is strictly adhered to. When I first took hold of the plant which I am at present handling I found that, through lax office methods, the discount day had lost its entire significance, consequently the delinquent list involved a very large number of names on the consumers' ledger. Owing to severe competition, this condition was very difficult to remedy, and, in fact, the ledger did not assume a healthy aspect in this condition until a new scale of reduced rates for gas had been established, which were, of course, widely advertised, and with them a new date for the discounting of bills brought into vogue. Today I am glad to say that, notwithstanding our business has seen an increase of more than 200 per cent. since the time I mention, we have to contend only with the average class of poor pay accounts. In dealing with this condition the average manager resorts to a deposit system best adapted to the condition peculiar to his business, which is a precaution, and the prepayment meter which is also a precaution, and as a means of remedying the damage done through misplaced confidence, he uses a system of follow-up letters, his attorney, and as a last resort oftentimes some collection agency. There is no one present who is not familiar with all these methods, so there is little room to expound on their merits or otherwise. The deposit plan is as old as the hills and is a subject upon which no comment may be made. As for the prepayment meter, I found that, in a canvass of 30 companies, taken at random in this district, and who are doing a business under 40 millions cubic feet annually, 5 have no prepayment meters, and that 12 have from 3 to 6 per cent. of their total meters of the prepayment type, that 10 more have about 10 per cent. of their total number of the prepayment type, and that the remaining 3 have nearly 75 per cent., which would indicate the growing popularity of this type of meter. It may be interesting to note that, of the companies mentioned who are using the prepayment meter, none report accounts of a year's standing, and still possible to collect, and but ¼ to ½ of 1 per cent. lost during the last year through non-payment, while those averages are somewhat higher with those companies using no prepayment meters. However, the higher price of this meter is an item which most managers stop to consider before installing them broadcast, in addition to which the subject of cash payment is one to be handled delicately in some cases for fear of possible offense. Of the letter writing plan, it may be said that its efficiency depends solely on the writer and his knowledge of the particular subject in hand, together with his ability for construction. He must understand, as far as possible, the nature of the person with whom he is corresponding, and must strive to strike the right personal note in each case. I believe that no one style of letter will apply successfully to any two types of the delinquent account. Probably the best method of all to be found is the employment of a good collector, and a collector's results, like those of a salesman's, are in ratio to his determination to succeed, coupled with his ability to understand the character of his subject. He must be a man of some versatility of mind, a man who can change his methods without appearing to annoy or disgruntle his subject. A man or woman of such accomplishment it will be found must be well paid. I have known young women who have made excellent collectors. As for the collection agency, my experience has indicated that the amount of good accomplished through this means is of a very questionable nature. These agencies have a plan of asking so much down on each account, of which they assume the responsibility of collection and a commission after the bill is paid. This plan strikes me as being infinitely one of the "all-to-gain and nothing-to-lose" type, as they can collect their commission upon the payment of any bill in their hands, regardless of the amount of influence really brought to bear by them in this particular case. I call to mind an instance of this kind which took place with us only two months ago. The account in question aggregated a considerable amount, covered a period of nearly a year, and was duly listed with a collection agency. In the course of time a combination of circumstances rendered it possible for the writer to collect this account in person, and notification of this fact was promptly rendered to the agency mentioned, whereupon a reply was received from them in which they assumed full credit for the success of the transaction, when, as a matter of fact, we had positive proof that their endeavors had carried not one whit of weight in this particular matter. Perhaps the one broad rule which may be accepted as applicable in general, and which will carry as much weight toward the end of keeping the uncollectable accounts down to the minimum, is close attention to collections and the engaging of a policy that will teach your consumers as a whole that this end of the business has your personal attention constantly, and that no one particular account can go unpaid and this condition remain unheeded by the manager for a great length of time. I have been in the habit of keeping on my desk a card form on which is listed monthly the accounts which have apparently escaped the collector, and on which I record the dates of the letters written, by which reference can be immediately made to the last letter, and the tone of that of the present writing is guided by the nature or tone of the one previous as well as the preceding letters. One other method can be used in some cases, and it is of a strategic nature, to say the least. I have found that, after a delinquent has ignored a number of notices, sending a statement for an amount somewhat larger than the bill in reality due, will, in a majority of cases, bring your man to the office in haste, whereupon the bookkeeper can readily plead an error. I have known the resultant relief to have a tendency to open the purse strings which nothing else could touch.

In the foregoing I have much the feeling of having reiterated the history of a world-old experience, and as though I had told you

nothing that you have not already known, yet I am sure I am one of the most eager to learn of any new methods of handling this question.

## A Gas Manager's Relation to the Public and to the Employees of His Company.

[Prepared for the Fourth Annual Meeting, Iowa District Gas Association, by MR. WM. E. DAVIS, Manager, South Omaha (Neb.) Gas Company.]

This subject affords a foundation for much speculation, concerning which undoubtedly we will find considerable diversity of opinion, especially as to the methods to be employed by a successful manager. From my limited experience and observation I would say that the manager's relation to the public is dependent opon the kind of community with which he has to deal. He must adapt his management to his particular people. The different communities might be classified as follows: Educational, agricultural, commercial, industrial, etc. Each locality has its relative class of public, and differs in its nature, condition and environment. A consistent, harmonious and thorough business management, however, must be suited to each case.

*The Manager's Relation to the Public.*—This position with any class of people is fraught with grave responsibilities. To attain that degree of success for his employer which is desirable he must possess special qualities of fitness and aptitude. Promptness of action in all emergencies, and a capacity for tactfully managing and dealing with the different natures with which he comes in contact are most valuable qualities. He should have a keen understanding of human nature, with constant self-culture and a growing experience in the practical affairs of life. Having as his constant guide the three great principles in any business, honesty, faithfulness and efficiency, the manager's usefulness and value to his employer will constantly increase.

The public's popular faith in the elemental qualities of his company's character is the foundation of its success; therefore, he has no time to waste in building up and keeping up the confidence of the public. He can wield a wonderful influence for good by keeping in close and friendly relations with leaders in his community; and will very readily inspire the goodwill and favor of the people by vigorously establishing the true business principles of his company. He must first secure the public's confidence; then, keep it, remembering the disastrous consequence of broken faith.

The manager is held accountable for the public's approval and goodwill, which are his company's most valuable assets. Having the welfare of his company at heart, he will exert every energy in the use of the best means to further its interests and increase its public favor and good standing. To accomplish this there can be no better or wiser method employed than to be thoroughly courteous and obliging at all times and on all occasions. Be fair and just. Let his actions be gentlemanly towards everybody, not only to the patrons he has already secured for his company, but to all.

His association must not only be with old patrons, but with the new ones he should always have in view. The public has an interest or an investment in his company's products; gas for heat, for light, for power. Not only does the public want these products, but relies upon the promises of the company's good service. The manager's promise is the company's obligation. He knows his company's purpose is to fulfil completely every obligation it has taken upon itself. If, to gratify his selfish or lazy disposition, he gives an inferior quality and a less quantity of good service, he is cheating the public out of what it pays for, cheating his company out of the public opinion or credit it deserves, and cheating himself out of the reputation he should cherish.

He will be obliged to serve all manner and class of people, and it is to be expected that some will be exacting and ridiculously unreasonable, while others will be just, pleasant and easy to satisfy. In any case he cannot afford to be other than respectful and civil. To be polite and patient under all circumstances is certainly no small task, but such will not fail to commend itself to men in authority.

In order to maintain friendly and satisfactory relations with all, I affirm that the company's reputation with the general public is governed more by the spirit exhibited by the rank-and-file of its employees than by the conduct of its general officers. The rank-and-file of employees are the ones who come in frequent and closer contact with the customers. On them devolve more closely the duty of keeping up friendly relations with the public. Careful and interested attention to detail work, energetic, skillful, painstaking workmanship and gentlemanly deportment never fail to secure friends. This high grade of service makes up the aspect of his company as it appears to the public. Consequently, the manager's responsibility is apparent.

Among the masses anywhere will be found fanatics and misguided souls who think that the gas company is a great, living octopus, watching and ever-ready to absorb their very lives at any opportunity. In such an unfortunate locality a manager who intends to do well, and is doing well, by all his company's patrons, is many times unjustly criticized and condemned. There is a general disposition on the part or the public, either to overlook or willfully forget, the great advantage received from the public service gas company, in free pipe installation, free distribution work, etc. There is no press comment or credit given the company for this work. The very minute the company makes a minimum charge for any such work, a great calamity howl goes up from the unfair press and public. This condition is intensified by certain politicians and demagogues who try to ride into public power by stirring up the passions of the people against corporations.

Much of the sentiment against public service gas companies, emanates from a class of people who are not, and never were, patrons of the company, and know little or nothing of the kind of services rendered.

To overcome much of this adverse sentiment I believe there should be expended, judiciously, a moderate sum in advertising the company's merits, keeping before the general public every phase of advantage to the people. True, it is impossible for a manager to please and thoroughly satisfy everybody. However, with an honest purpose in behalf of his company and its patrons, he can try to please everybody, and at least he can retain the respect of all for his company and himself. There are some too, no doubt, who think it near disgraceful to be in any way connected with a public service corporation. In my 9 years' experience with public service corporations, permit me to say, candidly and most emphatically, that I have had to do with men of as high and pure motives in our business as of any other walk in life.

The officials of the gas industries of this age are looked upon, by the thinking people, as men who are not asking or expecting anything other than equitable treatment at the hands of the public. They are competent, aggressive and successful men in their business, and, as they should be, careful and watchful of their company's interests. They always have in view, and are urging, best possible service to gas consumers. They are ever anxiously looking for new and improved devices in all kinds of gas appliances, fixtures, lamps, etc., and they are working out methods by which better and more satisfactory service can be given.

*The Manager's Relation to the Employees.*—The manager's relation to the employees of his company must be of a character sufficiently dignified to command their respectful attention. As a usual thing the spirit of any business gets its distinctive features from the men in charge of it. An open, friendly and cordial relation must, of a necessity, exist between the manager and employees. Such relations, too, should continue throughout the entire working force. If the manager practices himself the principles he requires from his help, the desired results will be more easily obtained. Let the manager impress upon the employees his and their identity of purpose; namely, to accomplish the work allotted them in such a manner as to promote their company's interests. Conditions which are wrong, either in the office or among the working force, are traceable to someone in authority; hence, the needed reform should begin with the man in charge. He should set an example of neatness, general order and precision.

Thorough organization in all branches of his work is essential. I am a staunch believer in the principle of putting men to work upon their own merits, but having them understand at the beginning that they are expected to work to certain reasonable requirements. If they are constructed of the right kind of material they will not betray the trust reposed in them, but will "make good" to the extent of their ability. If they are not worthy of his confidence, the manager will soon detect it, and then can make such disposition as will be best for all concerned.

The old plan of standing over men with a club is wrong and such practice tends toward degrading them. They should be educated to higher ideas of trust and faithfulness and the certain rewards that

follow. If dollars-and-cents were the only object or consideration, this method wisely and judiciously plied will bring richer returns. The manager is more or less responsible for the good or bad conduct of his men towards the public, the company and himself. Their conduct, in a great measure, is dependent upon his treatment of them. He should obtain from his men the very best there is in them. If his estimate of their worth happens to be a little too high, they will respond to meet his ideas, if they possess any sense of pride, and consequently he will exert an elevating influence. Let him express confidence in his men and let him show his good feeling and fellowship in his government of them. He must see to it that the moral atmosphere in which they are working is in a wholesome condition. His men should be made to feel free to express their own thoughts and opinions. By so doing they will become better and more capable, and at the same time the manager is likely to get some valuable information that he would otherwise miss.

Never overlook little courtesies when asking or receiving favors or accommodations of any kind. Always start and close the day's work right, with a cheerful "Good Morning" and "Good Night." This process of general thoughtfulness of the manager on all occasions, and the power of such friendly personal touch, work wonders in securing the absolute loyalty and faithfulness of the company's employees.

The manager should be careful to observe the personal rights and feelings of his men. He should never forget that a considerate and sympathetic manner will make them his friends. His friends are his company's friends. Give them expressions of satisfaction and commendation for their work when it is well done. If it is not done the very best and they have put earnest efforts into the work, trying to please and do the best possible, give them credit for their good intentions. Anyone in any work needs occasional words of approval and encouragement from his superiors. As a rule, I am sorry to say, men receive too little commendation for their efforts. The following extract from Waldo Pondray Warren's collections expresses an ideal way of dealing with men: "Deal with men by words, thoughts, attitudes, etc. Words of appreciation for work well done. Words of caution for unseen dangers. Words of helpful criticism for faulty work. Words of advice in times of uncertainty, and words of encouragement when the spirit is low."

In conclusion I would submit the following summary: First, as to the gas manager's relation to the public. The manager himself must be fitted for his position. The most important point is the pleasant manner in which he conducts his business with the public. His dealings must be of such convincing character as to inspire the public's confidence. The manager is accountable for the public's favor or ill will. He is responsible for the conduct of his employees toward the public. Prejudice of the people should be overcome by continually advertising the gas company's merits, informing the public of the advantages derived from its service and of the high character and standing of the company's officials.

Second, as to the gas manager's relation to the employees of his company. His relations with the employees must be friendly and cordial. The purposes of manager and employees should be identical, and he should set before his men an example of all the principles he would require practiced by them. He should put men to work upon their own merits and educate them to a high plane of fidelity. The manager's good government of his men is the result of his considerate treatment of them, and it is important that he should observe the rights and feelings of his men. The little acts of courtesy in his association with them, and his occasional words of encouragement, are the secrets of his success.

## Items of Interest
### FROM VARIOUS LOCALITIES.

MR. J. ALEX. MAYERS, of 56 Pine street, New York city, has secured the franchises necessary to the manufacture and distribution of gas in the towns of Westbrook and South Portland, Me. These places, which are contiguous to Portland proper, comprise a population of 18,000 people; furthermore, they are taking up necessarily the overflow population of Portland, which city is built now to the water's edge of the peninsula. The district has at present excellent water, sewer, traction and electric light facilities, and is growing rapidly. In fact there can be no doubt about it that Mr. Mayer's seems to have acquired rights that are well up in financial possibilities.

THE Gas Machinery Company, of Cleveland, O., has been awarded a contract for the erection of a complete set (6 feet 6 inches) of water gas apparatus by the proprietors of the Fitchburg (Mass.) Gas and Electric Company. The equipment includes a P. & A. water gas tar extractor and exhauster, and under the agreement the work is to be completed this fall.

IN a circular forwarded us by the General Gas Light Company, of Kalamazoo, Mich., under date of the 3d inst., the Company declares that it has solved completely one problem upon which it has been working for over 3 years. The problem was the bringing out of an inverted arc lamp that would be satisfactory to itself and to its patrons as well. The lamp is of the 5-light order, and it is now accepting small orders for immediate delivery; and it further declares that it will be in shape to supply the lamps in large quantities and in several units in time for the lighting season this fall.

THE following minute to the memory of Mr. John K. McIntire was adopted by a special committee (Messrs. R. R. Dickey, Jr., H. C. Graves and O. L. Gunckel) of the Board of Directors of the Dayton (O.) Gas Light and Coke Company, on June 30th:

"John K. McIntire, one of the oldest and most esteemed Directors of the Dayton Gas Light and Coke Company, has been removed by the hand of death. We, the Directors, desire to place on record our high appreciation of his worth as a valued associate, whose ripe judgment was always at the service of the Company. He was an esteemed friend; an honest, just and upright citizen. We deplore his loss and will miss his wise council; and, in this hour of common bereavement, we desire to extend to his family our heartfelt sympathy; and, as a mark of respect, order that this office shall be closed during the funeral, July 1, 1908."

THE Beloit (Wis.) Water, Gas and Electric Company has surrendered its new franchise—it was granted in 1905—and hereafter will work under the indeterminate clause of the State utilities law.

THE Macon (Ga.) Gas Light and Water Company has arranged to expend $15,000 this season in putting larger pipes than those now in use in certain streets of the city. The betterment will be mainly in the water division of the Company's plants.

MR. L. A. OGDEN, writing from Newark, N. J., under date of the 2d inst., incloses the following: "It is with regret that I notify you of the death, at his home in Clinton avenue, Newark, the night of the 28th ult., of Mr. H. R. Smith. Deceased was born in Newark, August 24th, 1848, and 20 years thereafter he engaged with his father in the furniture business in Newark. The venture proved a failure, and in the early seventies he secured a position on the staff of the Citizens Gas Company, of Newark, and, in one capacity or another, he continued in the service of the succeeding Companies up to the date of his death. His widow, two sons and a daughter survive him."

MR. W. A. ALDRICH, General Manager of the Tacoma (Wash.) Gas Light Company, writing under date of the 2d inst., sends on a lot of interesting chat—in fact "Aldy." could not be uninteresting if he tried—and an item cut out of the Tacoma *Ledger*, of the 30th ult. This is good enough to reprint and here it is:

"When Mrs. Bertha B. Bloom a few days ago laid her troubles before Humane Officer William Van Vooris, that official advised her to have her husband arrested for wife beating. The arrest was made, and Joseph Bloom, a barber, appeared in court yesterday afternoon. Police Judge Arnston heard the testimony and then ruled that the defendant was not guilty of wife beating. The worst that could be proved against the husband was that he pushed his wife out of the barber shop and into their apartments when she stood in the door crying because he would not let her have a gas stove. Judge Arnston was convinced that the wife was as much to blame for the family row as the husband."

In connection with this particular story Mr. Aldrich remarks: "This shows you how we are getting the people worked up. Needless to say I am going to see to it that that woman has a gas stove." Continuing, in a general way, Mr. Aldrich writes: "We have had another splendid year, and have put on about 800 additional consumers, and at the time of writing we are increasing at the rate of nearly 100 consumers per month. In the 2 years that I have been here we have put down a 20-mile, high pressure system, have practically rebuilt the works, and erected a home-made 7-foot water gas

set which on a 20-hour test produced 565,000 cubic feet. The Northwest still feels, in a measure, the financial stringency of the East, but in a much lower degree. The Chicago, Milwaukee and St. Paul, the Chicago Northwestern and the Union Pacific Railroads are all laying rails as fast as possible to Tacoma, and in 5 years' time, instead of 100,000 people we will have ¼ million. As you probably know, municipal ownership is rampant here. Electricity for residence uses is 5 cents per kilowatt; for business houses 2½ cents. Despite all that, we are not only holding our own but are gradually increasing our lighting, and we have now nearly 2,000 Humphrey gas arcs in use. The secret of it all is good service which we intend to give our patrons at any cost. In addition to good service it is my policy to take the public into our confidence. The gas business is a very practical one, there are no secrets in it, and the more friends we make with our people the stronger does our position become." And may his shadow never grow less.

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THE official record respecting the progress of the contest for the baseball championship in the clubs from the engineering and general business divisions of the Consolidated Gas, Electric Light and Power Company, of Baltimore, Md., is appended—record to June 28:

| Name of Club. | No. Games. | Won. | Lost. |
|---|---|---|---|
| Spring Garden | 7 | 7 | 0 |
| Main Office | 7 | 4 | 3 |
| Westport | 7 | 4 | 3 |
| Eutaw Street | 7 | 0 | 7 |

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MR. A. E. REYNOLDS, Manager of the coke department, Denver (Col.) Gas and Electric Company, announces that the price of coke per ton (2.000 pounds) during the current month will be $5, delivered.

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"L. B. R.," writing to us under date of July 2d, from New Albany, Ind., says: "I am quite sure his many friends in the gas business will congratulate John E. Potts, of the working staff of the United Gas and Electric Company, of this city, over his marriage, the evening of June 29th, to Miss Olive M. Durbin, of this city. I ask you to publish this, because 'Johnnie,' who has many friends, is of the sort that likes to break the news gently."

---

THE Charles Town (W.Va.) Gas and Water Company has arranged to issue $30,000 in bonds, to provide funds for main extensions to both divisions of its enterprise.

---

THE Wayne General Construction Company, of Fort Wayne, Ind., appeared before City Councils of Decatur, Ind., last Tuesday, and applied for the right to there construct and operate an artificial gas plant. Mr. Charles McCulloch is largely interested in the Construction Company.

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MR. C. E. WHITE, who recently resigned the position of Manager of the new business department of the Union Gas and Electric Company, of Cincinnati, came to New York the 4th inst., to join the home office staff of Messrs. H. L. Doherty & Co.

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MR. "HARRY" BURN, the Inspector of Gas and Meters for Birmingham, Ala, has a peculiar way of making his returns on meters inspected, as this excerpt from his report for last June will show—note the determination, "Correct or slow": "Newly installed electric meters inspected, 111. Fast, beyond law limit (4 per cent.), 3; fast, within law limit, 25; correct or slow, 83. All electric meters found fast were adjusted—the 25 that were within the 4 per cent. limit, as well as the 3 that were fast beyond the limit. An electric meter, inspected on complaint of consumer, was found 6 per cent. slow. New gas meters inspected, 32; fast beyond law limit (2 per cent.), 1; correct *or slow*, 31."

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IT might be well to note that the Inspector, in testing for heating values and purity, found the calorific value of the gas to equal 610 B.T.U's per cubic foot; hydrogen sulphide, none; candle power (average of 18 tests), 16.7."

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"V. T. M.," of Jersey City, N. J., is informed that the plant of the Galion (O.) Gas Company, which has been in the hands of a receiver for some time, was shut down at noon of the 24th ult. It is likely that under new ownership the plant will be remodeled and again start up some time late in the fall.

---

A CORRESPONDENT in Dubuque, Ia., writing under date of the 3d inst., says that the authorities of the city seem to have acted hastily, to say the least, in respect of the ordinance reducing the rate for gas that might be charged by the Key City Gas Company to 90 cents per 1,000 cubic feet, would seem proven, if the following report made by the City Attorney may be accepted as an indication. The City Attorney (George Lyon) was asked to pass an opinion upon the validity of the ordinance, and in response to that direction, after investigation, submitted the following:

"On February 20, 1908, the City Council of this city adopted an ordinance providing for the regulation of gas rates and meters and naming a penalty for the violation thereof.

"On April 6, 1908, the Key City Gas Company brought an action in the Circuit Court of the United States for the Northern Iowa Eastern division against the city of Dubuque, in which the said Company asked that the city be enjoined from enforcing the ordinance as passed on February 20, 1908, which action is still pending.

"On April 7, 1908, a temporary restraining order was issued by said Court. The ordinance adopted on February 20, 1908, was so adopted, as I am informed, without any investigation upon the part of the then City Council, and without giving the Key City Gas Company any notice of the intention of the Council to change the price or rates to be charged for gas. While the City Council undoubtedly has the authority to fix reasonable rates to be charged by the gas company, the gas company should have been given reasonable notice of the intention of the Council to exercise its rights to fix the same, as provided in Section 3 of the ordinance adopted by the City Council of this city on August 26, 1897, the said ordinance being Chapter 4 of special ordinances in the book of revised ordinances of 1901 of the city of Dubuque.

"It will undoubtedly cost the city a considerable sum to defend the aforesaid action and doubting my ability to successfully defend the action under the existing circumstances, I deem it my duty to advise the present Council to repeal the ordinance adopted February 20, 1908, and thus relieve the city from the expense of attempting to restrain the present amendment.

"I would therefore recommend your honorable body that the ordinance as amended and adopted on February 20, 1908, be repealed."

---

THE West Allis Light and Power Company has been incorporated under the "indeterminate" section of the public utilities laws of Wisconsin, to furnish gas and electric currents in West Allis. This is a scheme of the strike sort, for West Allis is now plentifully supplied with gas by the West Allis Gas Company and with electric current by the Milwaukee Light, Heat and Traction Company. However, the State Commission is in charge of such matters as this proposed Company brings about, wherefore it will be well to wait the outcome. The incorporators are John B. Meigs, H. G. Meigs and F. C. Weed. The Meigs are father and son, both of whom are known as "whooping politicians" in West Allis, and the third member of the trinity is a lawyer who some time ago, for one reason or another, removed his residence from New London, Conn.

---

THE Kerr Murray Manufacturing Company, of Fort Wayne, Ind., will construct 2 holders for the Citizens Gas Company, of Indianapolis. One is a storage holder up to retaining 1,000,000 cubic feet, the other a relief holder for water gas apparatus, up to retaining 20,000 cubic feet.

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MR. JACOB HOSE should make a good account collector for the York (Pa.) Gas Company, to which position he was recently appointed. He was formerly Chief of Police, of York.

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THE distribution scheme of the Missoula (Mont.) Gas Company calls for the placing of 12 miles of mains, which are now being put down under the direction of Mr. E. J. Gates. The generating plant in South Missoula will be completed by September 1st.

---

THE Board of Gas and Electric Light Commissioners of Massachusetts has issued an order approving the putting out, by the Vineyard Haven Gas Company, of $5,000 of new stock, to be issued at par.

---

THE American Public Works' Association will hold its annual meeting at Asheville, N. C., September 29th and 30th.

---

THE Consolidated Gas Company, of New York, has arranged with Messrs. N. W. Harris & Co., for an issue of $5,000,000 five per cent. collateral trust 5's, due August 10, 1909. These are to redeem a like number due August 10th next.

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A STROKE of lightning put the distributing wires of the Denver (Col.) Gas and Electric Company out of commission for some hours the evening of the 1st inst.

---

THE Committee on Light of the Richmond (Va.) City Councils, has agreed to deliver all the tar made in the city gas works for the ensuing twelvemonth to the Armitage Manufacturing Company, at its bid of 85 cents per barrel. Last year the price paid was $1.37½ per barrel.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS

MONDAY, JULY 13, 1908.

## The Market for Gas Securities.

The general share market kept up to higher values during the week, and in common with the rest Consolidated shared in the gains. The market opened to-day (Friday) at 128 bid, offered at ½. This stock is sure to make very much higher figures before the summer is at an end.

Brooklyn Union came out on the ticker yesterday, on a sale of 300 shares, at 115; and that figure was bid for more. Peoples, of Chicago, crossed 93 again, and this time nothing is likely to interfere with it going to par. The Massachusetts issues are also in better demand, the preferred having sold last week in this market at 86¼.

## Gas Stocks.

**Quotations by George W. Close, Broker and Dealer in Gas Stocks.**

16 WALL STREET, NEW YORK CITY.

JULY 13.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

| *N. Y. City Companies.* | *Capital.* | *Par.* | *Bid.* | *Asked.* |
|---|---|---|---|---|
| Consolidated | $73,177,000 | 100 | 128 | 128½ |
| Central Union Gas Co.— | | | | |
| 1st 5's, due 1928, J. & J. | 3,000,000 | 1,000 | 93 | 93½ |
| Equitable Gas Light Co.— | | | | |
| Con. 5's, due 1932, M. & S. | 1,000,000 | 1,000 | — | 105 |
| Mutual | 3,500,000 | 100 | 130 | 160 |
| New Amsterdam Gas Co.— | | | | |
| 1st Con. 5's, due 1948, J. & J. | 11,000,000 | 1,000 | 92 | 96 |
| New York & Richmond Gas Co. (Staten Island) | 1,500,000 | 100 | 37 | 43 |
| 1st Mtg. Gold Bds. 5 p. ct. | 1,000,000 | — | 96 | 104 |
| New York and East River— | | | | |
| 1st 5's, due 1944, J. & J. | 3,500,000 | 1,000 | 100 | 105 |
| Con. 5's, due 1945, J. & J. | 1,500,000 | — | 97 | 101 |
| Northern Union— | | | | |
| 1st 5's, due 1927, J. & J. | 1,250,000 | 1,000 | 90 | 98 |
| Standard | 5,000,000 | 100 | 70 | 100 |
| Preferred | 5,000,000 | 100 | 100 | 125 |
| 1st Mtg. 5's, due 1930, M. & N. | 1,500,000 | 1,000 | 100 | 105 |
| The Brooklyn Union | 15,000,000 | 1,000 | 110 | 120 |
| 1st Con. 5's, due 1948, M. & N. | 15,000,000 | — | 91½ | 92 |
| Yonkers | 200,000 | 500 | 130 | — |
| *Out-of-Town Companies.* | | | | |
| Bay State | 50,000,000 | 50 | 1 | 11-16 |
| " Income Bonds | 2,000,000 | 1,000 | — | 75 |
| Binghampton Gas Works | 450,000 | 100 | — | 65 |
| " 1st Mtg. 5's | 500,000 | 1,000 | 95 | 100 |
| Boston United Gas Co.— | | | | |
| 1st Series S. F. Trust | 7,000,000 | 1,000 | 82 | 85 |
| 2d " " " | 3,000,000 | 1,000 | 47½ | 50 |
| Buffalo City Gas Co. | 5,500,000 | 100 | 5 | 8 |
| " " Bonds, 5's | 4,250,000 | 1,000 | 63 | 66 |
| Capital, Sacramento | 500,000 | 50 | — | 35 |
| Bonds (6's) | 150,000 | 1,000 | — | — |
| Chicago Gas Co. Guaranteed Gold Bonds | 7,000,000 | 1,000 | 104 | 106½ |
| Cincinnati Gas and Electric Co. | 29,500,000 | 100 | 88½ | 89 |
| Columbus (O.) Gas Co., 1st Mortgage Bonds | 1,500,000 | 1,000 | 92 | 98 |
| Columbus (O.) Gas Lt. & Heating Co. | 1,662,750 | 100 | 87 | 88 |
| Preferred | 3,026,500 | 100 | 71 | 80 |
| Consumers, Toronto | 2,000,000 | 50 | 200 | 204 |
| Consolidated, Baltimore | 11,000,000 | 100 | — | 105 |
| Mortgages, 6's | 3,600,000 | — | — | 118 |
| Chesapeake, 1st 6's | 1,000,000 | — | — | — |
| Equitable, 1st 6's | 910,000 | — | — | — |
| Consolidated, 1st 5's | 1,490,000 | — | — | 112 |
| Consolidated Gas Co. of N. J. | 1,000,000 | 100 | 15 | 17 |
| Con. Mtg. 5's | 880,000 | 1,000 | 92 | 95 |
| Bonds | 75,000 | — | — | 100 |
| Denver Gas and Electric | — | — | 74½ | 75 |
| Detroit City Gas Co. | 6,000,000 | 50 | — | 50 |
| " Prior Lien 5's | 4,618,000 | 1,000 | — | 98 |
| Detroit Gas Co., 5's | 381,000 | 1,000 | 75 | 80 |
| " Inc. 5's | 16,000 | 100 | 98½ | 100 |
| Equitable Gas & Fuel Co., Chicago, Bonds | 2,000,000 | 1,000 | — | 101 |
| Essex and Hudson Gas Co. | 6,500,000 | — | 30 | 40 |
| ort Wayne | 2,000,000 | — | — | — |
| Bonds | 2,000,000 | — | 55 | — |
| Grand Rapids Gas Lt. Co., 1st Mtg. 5's | 1,225,000 | 1,000 | 104½ | 105 |
| Hartford | 750,000 | 25 | 190 | 200 |
| Hudson County Gas Co., of New Jersey | 10,500,000 | — | 100 | 105 |
| " Bonds, 5's | 10,500,000 | — | 101 | 102½ |
| Indianapolis | 2,000,000 | — | 60 | 70 |
| " Bonds, 5's | 2,650,000 | — | 104½ | 105 |
| Jackson Gas Co. | 250,000 | 10 | 82 | — |
| " 1st Mtg. 5's | 290,000 | 1,000 | 97 | 100 |
| Kansas City Gas Light Co., of Missouri | 5,000,000 | 100 | — | 36 |
| Bonds, 1st 5's | 3,822,000 | 1,000 | 102 | 104 |
| Laclede, St. Louis | 10,000,000 | 100 | — | 100 |
| Preferred | 2,500,000 | 100 | 60 | 10 |
| Bonds | 10,000,000 | 1,000 | 104 | 104½ |
| Lafayette Gas Co., Ind. | 1,000,000 | 100 | — | 60 |
| Bonds | 1,000,000 | 1,000 | 60 | 65 |
| Louisville | 2,370,000 | 50 | 143 | 145 |
| Madison Gas & Elec. Co. | | | | |
| " 1st Mtg. 6's | 350,000 | 1,000 | 106 | 108¾ |
| " 6 per cent. scrip, due 1910 | 100,000 | 25 | 60 | 60½ |
| Massachusetts Gas Companies, of Boston | 25,000,000 | 100 | 53¾ | 53 |
| Preferred | 25,000,000 | 100 | 86 | 87 |
| Montreal, Canada | 2,000,000 | 100 | 215 | 218¾ |
| Nashville Gas Lt. Co. | 1,000,000 | 100 | 110 | — |
| Newark, N. J., Con. Gas Co. | 6,000,000 | — | 56 | 58 |
| Bonds, 6's | 6,000,000 | — | 137 | 138 |
| New Haven | 2,000,000 | 25 | 200 | — |
| Peoples Gas Lt. & Coke Co., Chicago | 25,000,000 | 100 | 93 | 93¼ |
| 1st Mortgage | 20,100,000 | 1,000 | — | — |
| 2d " | 2,500,000 | 1,000 | 104 | — |
| Rochester Gas & Elec. Co. | 2,150,000 | 50 | 88 | — |
| Preferred | 2,150,000 | 50 | 118 | — |
| Consolidated 5's | 2,000,000 | — | 104½ | 105½ |
| San Francisco, Cal. | 15,500,000 | — | — | — |
| St. Joseph Gas Co.— | | | | |
| 1st Mtg. 5's | 751,000 | 1,000 | 92 | — |
| St. Paul Gas Light Co. | 1,500,000 | 100 | 45 | 47 |
| 1st Mortgages, 6's | 650,000 | 1,000 | 113 | 116 |
| Extension, 6's | 600,000 | 1,000 | 112½ | 115 |
| General Mortgage, 5's | 2,465,000 | 1,000 | 96¼ | — |
| Syracuse, N. Y. | 1,378,000 | 100 | 50 | 55 |
| Bonds | 2,047,000 | 1,000 | 102 | — |
| Washington, D. C. | 2,600,000 | 20 | 325 | 335 |
| 1st Mortgage, 6's | 600,000 | — | — | — |
| Western, Milwaukee | 4,000,000 | — | — | — |
| Wilmington, Del. | 600,000 | 50 | 220 | — |

## Advertisers' Index.


**GAS ENGINEERS.**

| | Page |
|---|---|
| Cruse-Kemper Co., Philadelphia, Pa. | 68 |
| Davis & Farnum Mfg. Co., Waltham, Mass. | 80 |
| Economical Gas Apparatus Construc. Co., Toronto, Ont. | 79 |
| Frank D. Moses, Trenton, N. J. | 82 |
| Frederic Egner, Norfolk, Va. | 84 |
| Frederick J. Mayer, New York City | 65 |
| H. M. Byllesby & Co., Chicago, Ills. | 80 |
| Humphreys & Glasgow, New York City | 80 |
| Isbell-Porter Co., Newark, N. J. | 68 |
| Kerr Murray Mfg. Co., Fort Wayne, Ind. | 81 |
| The Gas Machinery Co., Cleveland, O. | 64 |
| The Jeffrey Manufacturing Co., Columbus, O. | 78 |
| United Gas Improvement Co., Philadelphia, Pa. | 75 |
| Western Gas Construction Co., Fort Wayne, Ind. | 44 |

**GAS WORKS APPARATUS AND CONSTRUCTION.**

| | |
|---|---|
| Connelly Iron Sponge & Governor Co., New York City. | 77 |
| Continental Iron Works, Brooklyn, N. Y. | 82 |
| Cruse-Kemper Co., Philadelphia, Pa. | 68 |
| Davis & Farnum Mfg. Co., Waltham, Mass. | 80 |
| Deily & Fowler Mfg. Co., Philadelphia, Pa. | 84 |
| Economical Gas Apparatus Construc. Co., Toronto, Ont. | 79 |
| Frank D. Moses, Trenton, N. J. | 82 |
| Humphreys & Glasgow, New York City | 80 |
| Isbell-Porter Co., New York City | 68 |
| Kerr Murray Mfg. Co., Fort Wayne, Ind. | 81 |
| Lloyd Construction Co., Detroit, Mich. | 70 |
| Logan Iron Works, Brooklyn, N. Y. | 84 |
| Quintard Iron Works, New York City | 69 |
| R. D. Wood & Co., Philadelphia, Pa. | 82 |
| Riter-Conley Mfg. Co., Pittsburgh, Pa. | 67 |
| Stacey Mfg. Co., Cincinnati, O. | 83 |
| The Gas Machinery Co., Cleveland, O. | 64 |
| The Jeffrey Manufacturing Co., Columbus, O. | 78 |
| United Gas Improvement Co., Philadelphia, Pa. | 75 |
| Western Gas Construction Co., Fort Wayne, Ind. | 44 |

**PROCESSES.**

| | |
|---|---|
| Bartlett, Hayward & Co., Baltimore, Md. | 81 |
| Economical Gas Apparatus Construc. Co., Toronto, Ont. | 79 |
| Humphreys & Glasgow, New York City. | 80 |
| Semet-Solvay Co., Syracuse, N. Y. | 78 |
| The Gas Machinery Co., Cleveland, O. | 64 |
| United Gas Improvement Co., Philadelphia, Pa. | 75 |
| Western Gas Construction Co., Fort Wayne, Ind. | 44 |

**SCRUBBERS AND CONDENSERS.**

| | |
|---|---|
| Continental Iron Works, Brooklyn, N. Y. | 82 |
| Cruse-Kemper Co., Philadelphia, Pa. | 68 |
| Davis & Farnum Mfg. Co., Waltham, Mass. | 80 |
| Economical Gas Apparatus Construc. Co. Toronto, Ont. | 79 |
| Isbell-Porter Co., Newark, N. J. | 68 |
| Kerr Murray Mfg. Co., Fort Wayne, Ind. | 81 |
| Logan Iron Works, Brooklyn, N. Y. | 84 |
| R. D. Wood & Co., Philadelphia, Pa. | 82 |
| Riter-Conley Mfg. Co., Pittsburgh, Pa. | 67 |
| Stacey Mfg. Co., Cincinnati, O. | 83 |
| The Gas Machinery Co., Cleveland, O. | 64 |
| Western Gas Construction Co., Fort Wayne, Ind. | 44 |

**PRODUCER POWER PLANTS.**

| | |
|---|---|
| Economical Gas Apparatus Construc. Co., Toronto, Ont. | 79 |
| R. D. Wood & Co., Philadelphia, Pa. | 82 |

**TAR AND CARBONIC ACID EXTRACTOR.**

| | |
|---|---|
| Economical Gas Apparatus Construc. Co., Toronto, Ont. | 79 |
| Isbell-Porter Co., Newark, N. J. | 68 |
| Kerr Murray Mfg. Co., Fort Wayne, Ind. | 81 |
| Stacey Mfg. Co., Cincinnati, O. | 83 |
| The Gas Machinery Co., Cleveland, O. | 64 |
| Western Gas Construction Co., Fort Wayne, Ind. | 44 |

**AMMONIA CONCENTRATORS.**

| | |
|---|---|
| Michigan Ammonia Works, Detroit, Mich. | 61 |
| The Gas Machinery Co., Cleveland, O. | 64 |
| Western Gas Construction Co., Fort Wayne, Ind. | 44 |

**GAS METERS.**

| | |
|---|---|
| American Meter Co., New York and Philadelphia. | 87 |
| D. McDonald & Co., Albany, N. Y. | 85 |
| Helme & McIlhenny, Philadelphia, Pa. | 87 |
| John J. Griffin & Co., Philadelphia, Pa. | 88 |
| Keystone Meter Co., Royersford, Pa. | 86 |
| Maryland Meter and Mfg. Co., Baltimore, Md. | 86 |
| Metric Metal Co., Erie, Pa. | 87 |
| Nathaniel Tufts Meter Co., Boston, Mass. | 86 |
| New York Improved Meter Co., New York City. | 86 |
| Pittsburg Meter Co., East Pittsburg, Pa. | 85 |
| Rotary Meter Co., New York City | 63 |
| Sprague Meter Co., Bridgeport, Conn. | 62 |
| United States Meter Co, Brooklyn, N. Y. | 62 |

**PREPAYMENT METERS.**

| | |
|---|---|
| American Meter Co., New York and Philadelphia. | 87 |
| D. McDonald & Co., Albany, N. Y. | 85 |
| Helme & McIlhenny, Philadelphia, Pa. | 87 |
| John J. Griffin & Co., Philadelphia, Pa. | 88 |
| Keystone Meter Co., Royersford, Pa. | 86 |
| Nathaniel Tufts Meter Co., Boston, Mass. | 86 |
| New York Improved Meter Co., New York City. | 86 |
| Pittsburg Meter Co., East Pittsburg, Pa. | 85 |
| Sprague Meter Co., Bridgeport, Conn. | 62 |

**PREPAYMENT METER ATTACHMENTS.**

| | |
|---|---|
| New York Improved Meter Co., New York City. | 86 |

**WATER METERS.**

| | |
|---|---|
| Pittsburg Meter Co., East Pittsburg, Pa. | 85 |

**GAS AND WATER PIPES.**

| | |
|---|---|
| Davis & Farnum Mfg. Co., Waltham, Mass. | 80 |
| Donaldson Iron Co., Emaus, Pa. | 82 |
| Economical Gas Apparatus Construc. Co., Toronto, Ont. | 79 |
| R. D. Wood & Co., Philadelphia, Pa. | 82 |

**GAS COALS.**

| | |
|---|---|
| Berwind-White Coal Mining Co., New York and Phila. | 78 |
| Perkins Co., New York City | 78 |
| Westmoreland Gas Coal Co., Philadelphia, Pa. | 79 |

**GAS MAIN STOPPERS.**

| | |
|---|---|
| Edward A. Behringer, New York City | 82 |
| Safety Gas Main Stopper Co., New York City. | 77, 79 |

**MAIN AND SERVICE LAYING.**

| | |
|---|---|
| Sullivan Bros., Flushing, N. Y. | 79 |

**GAS TAPPING MACHINES.**

| | |
|---|---|
| George Light, Dayton, O. | 79 |
| H. Mueller Manufacturing Co., Decatur, Ills. | 70 |

**CANNEL COALS.**

| | |
|---|---|
| Perkins & Co., New York City | 78 |

**STOKING MACHINERY.**

| | |
|---|---|
| G. A. Bronder, New York City | 77 |

**CONVEYORS—ALL KINDS.**

| | |
|---|---|
| Brown Hoisting Machinery Co., Cleveland, O. | 70 |
| Cruse-Kemper Co., Philadelphia, Pa. | 68 |
| C. W. Hunt Company, New York City | 80 |
| Economical Gas Apparatus Construc. Co., Toronto, Ont. | 79 |
| G. A. Bronder, New York City | 77 |
| Kerr Murray Mfg. Co., Fort Wayne, Ind. | 81 |
| The Gas Machinery Co., Cleveland, O. | 64 |
| The Jeffrey Manufacturing Co., Columbus, O. | 78 |
| Western Gas Construction Co., Fort Wayne, Ind. | 44 |

**CHARGING BARROWS & COAL WAGONS.**

Davis & Farnum Mfg. Co., Waltham, Mass..... 80
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 81
Stacey Mfg. Co., Cincinnati, O..... 83

**GAS ENRICHERS.**

Standard Oil Co., New York City..... 85

**COKE CRUSHERS.**

C. M. Keller, Columbus, Ind..... 79
The Jeffrey Manufacturing Co., Columbus, O..... 78

**GAS METER CONNECTIONS.**

H. Mueller Manufacturing Co., Decatur, Ills..... 70

**GAS COCKS.**

H. Mueller Manufacturing Co., Decatur, Ills..... 70

**GAS GAUGES.**

The Bristol Co., Waterbury, Conn..... 72

**GAS GOVERNORS.**

Chaplin-Fulton Mfg. Co., Pittsburg, Pa..... 88
Connelly Iron Sponge & Governor Co., New York City. 77
Isbell-Porter Co., Newark, N. J..... 68
Pittsburg Meter Co., East Pittsburg, Pa..... 85
R. D. Wood & Co., Philadelphia, Pa..... 82
Reynolds Gas Regulator Co., Anderson, Ind..... 77

**CEMENTS.**

C. L. Gerould, Pittsburgh, Pa..... 82

**RETORTS AND FIREBRICKS.**

Baltimore Retort and Firebrick Co., Baltimore, Md... 76
Didier-March Co., New York City..... 65
Gas Bench Construction Co., St. Louis, Mo..... 76
Henry Maurer & Son, New York City..... 69
Improved Equipment Company, New York City..... 66
James Gardner, Jr., Co., Bolivar, Pa..... 78
J. H. Gautier & Co., Jersey City, N. J..... 76
Laclede-Christy Clay Products Co., St. Louis, Mo..... 69
Missouri Firebrick Co., St. Louis, Mo..... 76
Parker-Russell Mining and Mfg. Co., St. Louis, Mo.... 72

**INCLINED RETORTS.**

Baltimore Retort and Firebrick Co., Baltimore, Md... 76
Didier-March Co., New York City..... 65
Gas Bench Construction Co., St. Louis, Mo..... 76
Laclede-Christy Clay Products Co., St. Louis, Mo..... 69
Parker-Russell Mining and Mfg. Co., St. Louis, Mo... 72

**VERTICAL S'S.**

Connelly Iron Sponge & Gov. Co. (Drake's [Eng.] System) 77
Didier-March Co., New York City..... 65
Gas Bench Construction Co., St. Louis, Mo..... 76
Laclede-Christy Clay Products Co., St. Louis, Mo..... 69
Parker-Russell Mining and Mfg. Co., St. Louis, Mo... 72

**REGENERATIVE FURNACES.**

Baltimore Retort and Firebrick Co., Baltimore, Md.. 76
Bartlett, Hayward & Co., Baltimore, Md..... 81
Didier-March Co., New York City..... 65
Gas Bench Construction Co., St. Louis, Mo..... 76
J. H. Gautier & Co., Jersey City, N. J..... 76
Laclede-Christy Clay Products Co., St. Louis, Mo..... 69
Missouri Firebrick Co., St. Louis, Mo..... 76
Parker-Russell Mining and Mfg. Co., St. Louis, Mo... 72

**SELF-SEALING MOUTHPIECE DOORS.**

Continental Iron Works, Brooklyn, N. Y..... 83
Davis & Farnum Mfg. Co., Waltham, Mass..... 80
Isbell-Porter Co., Newark, N. J..... 68
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 81
Logan Iron Works, Brooklyn, N. Y..... 84
R. D. Wood & Co., Philadelphia, Pa..... 82
Stacey Mfg. Co., Cincinnati, O..... 83
The Gas Machinery Co., Cleveland, O..... 64
Western Gas Construction Co., Fort Wayne, Ind..... 44

**INCANDESCENT GAS LAMPS.**

General Gas Light Co., Kalamazoo, Mich..... 71
Welsbach Company, Gloucester, N. J..... 74

**BURNERS.**

Wm. M. Crane Co., New York City..... 72

**STREET LAMPS.**

Thos. T. W. Miner, New York City..... 80
Welsbach Street Lighting Co., New York and Phila.. 74

**DRILLS—ROCK AND STONE.**

The Jeffrey Manufacturing Co., Columbus, O..... 78

**PULVERIZERS.**

The Jeffrey Manufacturing Co., Columbus, O..... 78

**PURIFIERS.**

Connelly Iron Sponge & Governor Co., New York City. 77
Cruse-Kemper Co., Philadelphia, Pa..... 68
Davis & Farnum Mfg. Co., Waltham, Mass..... 80
Isbell-Porter Co., Newark, N. J..... 68
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 81
R. D. Wood & Co., Philadelphia, Pa..... 82
Stacey Mfg. Co., Cincinnati, O..... 83
Western Gas Construction Co., Fort Wayne, Ind..... 44

**PURIFYING MATERIALS.**

Connelly Iron Sponge & Governor Co., New York City 77
Western Oxide and Specialty Co., Chicago, Ills..... 83

**VALVES.**

Continental Iron Works, Brooklin, N. Y..... 83
Davis & Farnum Mfg. Co., Waltham, Mass..... 80
Economical Gas Apparatus Construc. Co., Toronto, Ont. 79
Isbell-Porter Co., Newark, N. J..... 68
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 81
Ludlow Valve Manufacturing Co., Troy, N. Y..... 69
R. D. Wood & Co., Philadelphia, Pa..... 82
Stacey Mfg. Co., Cincinnati, O..... 83
The Gas Machinery Co., Cleveland, O..... 64
The P. H. & F. M. Roots Co., Connersville, Ind..... 71
Western Gas Construction Co., Fort Wayne, Ind..... 44

**EXHAUSTERS.**

Connelly Iron Sponge & Governor Co., New York City 77
Connersville Blower Company, Connersville, Ind..... 62
Davis & Farnum Mfg. Co., Waltham, Mass..... 80
Isbell-Porter Company, Newark, N J..... 68
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 81
Piqua Blower Co., Piqua, O..... 69
The P. H. & F. M. Roots Co., Connersville, Ind..... 71

**PURIFIER AND SCRUBBER TRAYS.**

Cabot Mfg. Co., Hoboken, N. J..... 79
Western Gas Construction Co., Fort Wayne, Ind..... 44

**GAS STOVES.**

American Meter Co., New York and Philadelphia..... 87
Keystone Meter Co., Royersford, Pa..... 87
Maryland Meter & Manufacturing Co., Baltimore, Md... 86
Nathaniel Tufts Meter Co., Boston, Mass..... 86

**HOT WATER HEATERS.**

Humphrey Co., Kalamazoo, Mich..... 70

**GASHOLDERS.**

Bartlett, Hayward & Co., Baltimore, Md..... 81
Continental Iron Works, Brooklyn, N. Y..... 83
Cruse-Kemper Co., Philadelphia, Pa..... 68
Davis & Farnum Mfg. Co., Waltham, Mass..... 80
Deily & Fowler Mfg. Co., Philadelphia, Pa..... 84
Economical Gas Apparatus Construc. Co., Toronto, Ont. 79
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 81
Logan Iron Works, Brooklyn, N. Y..... 84
R. D. Wood & Co., Philadelphia, Pa..... 82
Riter-Conley Mfg. Co., Pittsburgh, Pa..... 67
Stacey Mfg. Co., Cincinnati, O..... 83
Western Gas Construction Co., Fort Wayne, Ind..... 44

**STORAGE TANKS.**

Davis & Farnum Mfg. Co., Waltham, Mass..... 80
Stacey Mfg. Co., Cincinnati, O..... 83
Western Gas Construction Co., Fort Wayne, Ind..... 44

**PATENTS, TRADE-MARKS, COPYRIGHTS.**

Royal E. Burnham, Washington, D. C..... 77

**DIVIDEND NOTICE.**

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., June 10, 1908.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable July 15th, 1908, to stockholders of record at the close of business, June 30, 1908. Checks will be mailed.

1723-5 LEWIS LILLIE, Treasurer.

## PRACTICAL GAS SUPERINTENDENT

**Desires Permanent Position with Medium or Small Gas Company as Manager or Superintendent.**

Qualified to take entire charge of both coal and water gas properties. Clean record. Twenty-five years' experience.

1726-4 Address, "D. H. H.," care this Journal.

## Position Wanted

**As Manager or Superintendent,**

By competent gas man, 35 years of age, married, strictly sober, with operating experience both as manager and superintendent in actual charge of plants. A man who can show and give results; 17 years' experience; now acting as manager of coal gas plant in city of 15,000. Will have to give present people 60 days' notice. Address,

1727-eot-tf "RESULTS," care this Journal.

## Position Wanted

**As Superintendent of Coal or Water Gas Plant.**

Understands heats and purifying thoroughly. Thirty-nine years old; 20 years with one company. A-1 references. Correspondence solicited.

1725-3 Address, "N. M. H.," care this Journal.

## WANTED,

**Position as General Foreman,**

By a thorough, practical gas man. Warrant good results. Coal gas works, Central States preferred. Address, "N. Y.,"

1727-1 Care this Journal.

## WANTED.

**Position as Manager, Superintendent or Engineer.**

A young married man, who has had nine (9) years' practical experience in office systems, distribution, operation and construction of both coal and water gas properties. Prefers in city of 20,000 to 50,000 population, either North or South. Party is a draughtsman and can handle transit and leveling idstruments.

1726-3 Address, "XOR," care this Journal.

## Situation Wanted.

Young man, 30 years of age, and of 12 years' practical experience in gas manufacture and distribution, wishes situation as engineer or superintendent of a gas company where expert services are required and the output is at least 50,000 per day. Is graduate engineer and at present superintendent of one of the largest high pressure plants in the U. S. The best of references and experience only.

1726-2 Address, "S. R. U.," care this Journal

## Position Wanted

**By All-Round Gasfitter. Complaint and Welsbach Lamp Man.**

Strictly sober. Can furnish best of references. Address, "W. F.,"

1727-1 Care this Journal.

## WANTED.

**A Superintendent for a Small Coal Gas Plant**

In town of 13,000 inhabitants, in Mississippi. Must have had experience with mains as well as retort house. Furnish reference.

1728-2 Address, "MISSISSIPPI," care this Journal.

## WANTED,

**CAPABLE GAS MAKER AND HELPER FOR SMALL PLANT.**

Western New York. References required.

1725-1 Address, "B. C.," care this Journal.

## WANTED,

**One Second-Hand Purifying Box,**

Not less than 12 or more than 20 feet square. Give price and particulars in first letter.

Address, JOHN H. FITZGERALD,

1727-2 BOX 849, BEAUMONT, TEX.

## FOR SALE.

**One 7-foot American Meter Co. Station Meter,** with 12-inch connections. The meter was built in 1896, and is in first-class condition.

**Three Cast Iron Purifying Boxes,** 21 feet by 21 feet by 4 feet deep; seal, 30 inches deep.

**One Traveling Crane** (track on floor), with oil pump and fittings complete, and 12-inch pipe, valves and fittings for a 3 box system complete.

Address, GEO. LIGHT.

1715-tf DAYTON, O.

## TO GAS MANAGERS.

**We have Forty-five 5-Inch Firkwood Boiler Burners, Twenty-one 5-Inch and Eight 3-Inch Gwynn Burners, for Sale.**

These burners have been used a few months, but are in perfect working condition. Will sell at a bargain.

1725-4 CHEMUNG CO. GAS CO., Elmira, N.Y.

**Utilize Your Gas Liquor.**

NO EXTRA LABOR OR OPERATING EXPENSES.

**IMPROVED AMMONIA CONCENTRATOR.**

About 100 in use. Write to

STROH & OSIUS, Patentees, or

MICHIGAN AMMONIA WORKS, - Detroit, Mich.

# HOW'S YOUR METER'S LUNGS?

INLET AT TOP.

Diaphragms are to meters what lungs are to men. Condensation is to a diaphragm what Tuberculosis is to the lungs. The worse the disease the sooner the finish. The functions of both are destroyed eventually. One may never be replaced, the other, the diaphragm, may be, but at considerable cost. The way to avoid this is to use a

## "SELF-DRAINING METER,"

Guaranteed free of Repairs for two years. Condensation never reaches diaphragm, insuring longer life.

**ALWAYS ACCURATE.**

Low speed. Extra Heavy Tin Used. Thoroughly Seasoned Diaphragm.

**SAVES OVER 75 PER CENT. IN ANNUAL COST REPAIRS.**

**LARGEST CAPACITY of any METER MADE.**

Write me for price, particulars, or to call.

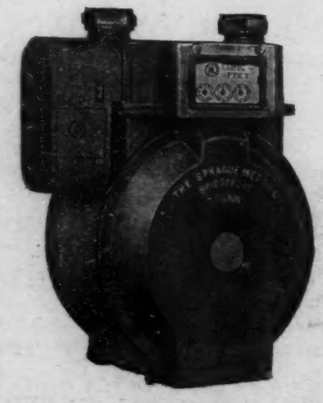
E. W. BROWN, Sole Agent,

229 to 269 Chestnut Street, Brooklyn, N. Y.

INLET AT BOTTOM.

PATENTED MAY 13, 1902.

PATENTED MAY 13, 1902.



# The Sprague Meter Co.

Manufacturers of

## Cast Iron Gas Meters

for

## Artificial or Natural Gas

**Plain or Prepayment**

**Lower in first cost and cheaper to maintain than any meter on the market.**

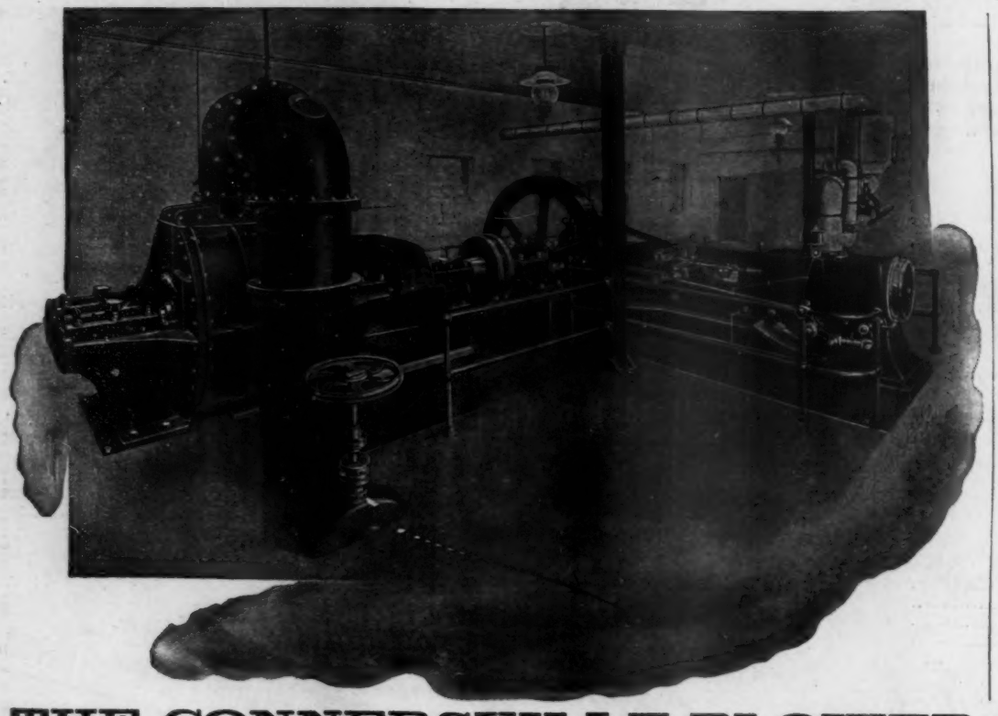
**Write us for particulars.**

**The Sprague Meter Company**

**203 Water St., Bridgeport, Conn.**

# CONNERSVILLE GAS EXHAUSTERS

## AND HIGH PRESSURE GAS PUMPS.



THIS cut shows one of our High Pressure machines and a 4-valve engine connected by one of our leather link flexible couplings. Two of these units were installed for the Peoples Gas Light and Coke Co., Chicago, at their 73d St. Station. Each machine has a capacity of 14,000,000 cubic feet per day.

—o—

We also manufacture

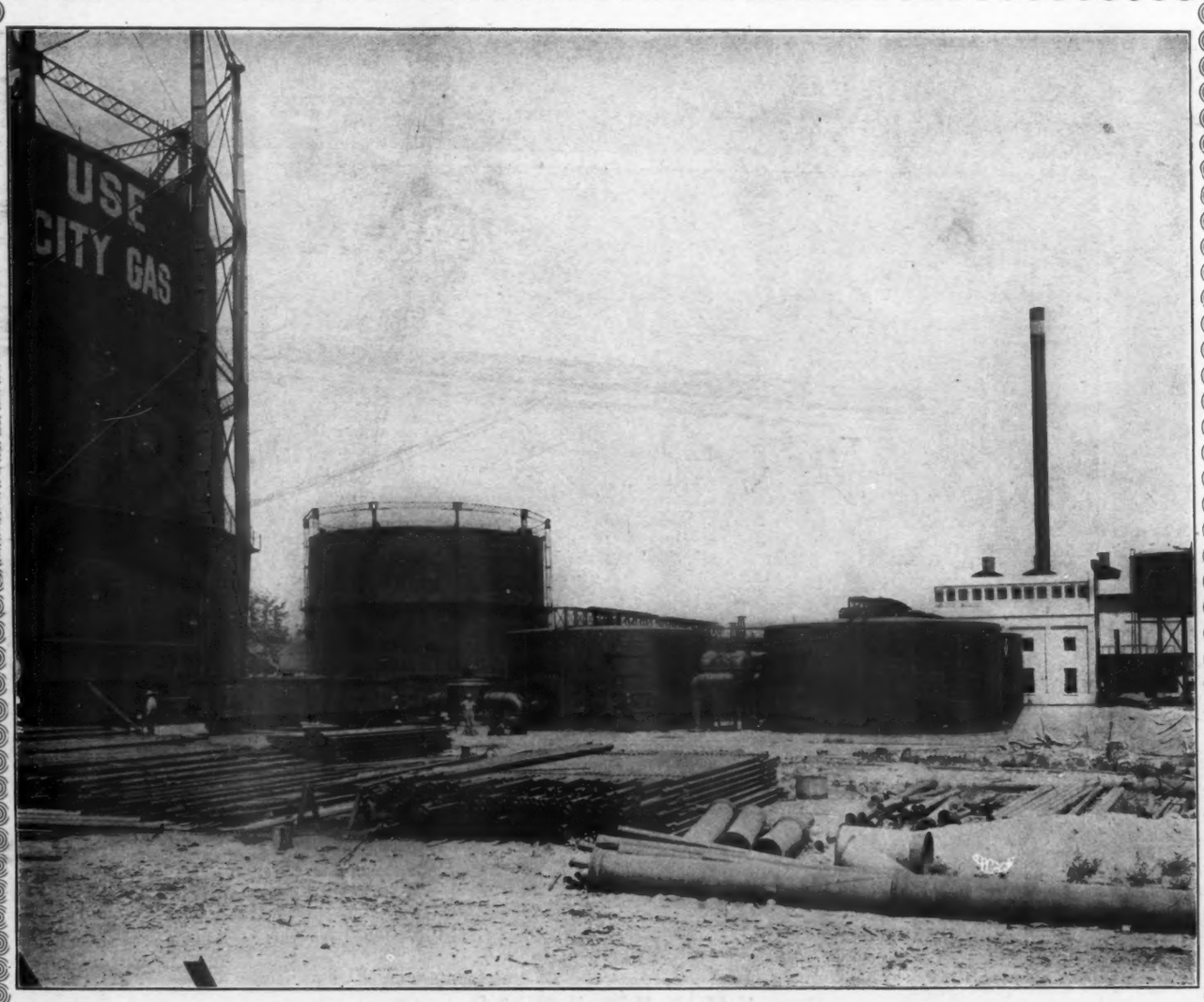
**GAS VALVES,**
**BY-PASS VALVES,**
**PRESSURE REGULATORS,**
**ETC., ETC.**

**Correspondence Solicited.**

## THE CONNERSVILLE BLOWER COMPANY,

Connersville, Indiana, U. S. A.

**NEW YORK OFFICE, 95 Liberty Street. - - HORACE C. COOKE, Selling Agent.**




Installation of the 5,000,000 Cubic Foot Per Day

# ROTARY STATION METER

At the Works of the City Gas Company, Los Angeles, California.

We have Recently Contracted with the ILLINOIS STEEL COMPANY (United States Steel Corporation) for the delivery of

## FOUR (4) ROTARY STATION METERS,

Each Having a Capacity of **3,840,000 Cubic Feet per Day.**

These Machines will be Installed at Joliet, Illinois, to Measure Product of Coke Ovens Now Under Construction by that Company.

One-half the cost—One-tenth the space of old style wet meters.

When in need of Station Meters, write

**ROTARY METER COMPANY,**

280 Broadway,

NEW YORK.

Send for Catalog.

P. PLANTINGA, President W. E. STEINWEDELL, Secretary

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Main Office and Shops

CLEVELAND, OHIO.

NEW YORK OFFICE, - - - 56 PINE STREET.

COAL AND WATER GAS APPARATUS,
EXHAUSTERS, CONDENSERS, SCRUBBERS,
TAR EXTRACTORS, WASHERS, PURIFIERS,
VALVES, CONNECTIONS,
BY PRODUCT MACHINERY,
COMPLETE GAS PLANTS.

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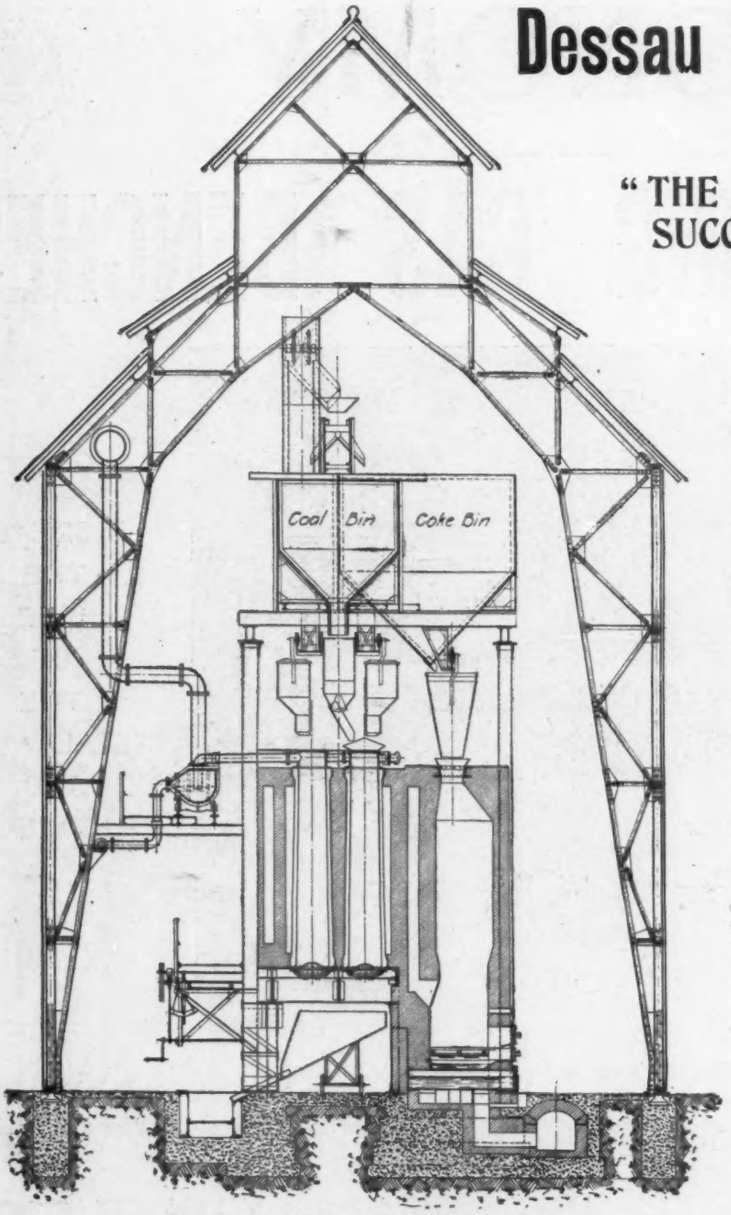
APPARATUS
FOR MANUFACTURING
AQUA AMMONIA
AND
ANHYDROUS AMMONIA.

THE GAS MACHINERY CO.
CLEVELAND, OHIO.

# Dessau System of Vertical Retorts.

"THE ONLY SYSTEM IN SUCCESSFUL OPERATION."




Cross Section of Retort House for Vertical Benches.

- Nineteen Installations with 126 Benches in operation.
- **ELEVEN** Installations with **96** Benches in course of construction.
- Maximum gas produced per man per 24 hours, 360,000 cu. ft.
- Ten per cent. increase in yield of gas.
- Forty per cent. increase in yield of ammonia.
- Best quality of coke.
- Least percentage of breeze.
- Low fuel consumption.
- Tar produced low in carbon.
- Extreme low cost of retort house labor.
- Minimum expense in wear and tear.
- No Naphthaline.
- No Cyanogen.

## Present Producing Capacity, 25 Million Cu. Ft.

Within **90 days** the above producing capacity has been increased to **31 Million Cubic Feet** by additional orders for **39 benches** with **390 retorts.**

## DIDIER-MARCH COMPANY,

FREDERICK J. MAYER, General Manager.

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New York City, N. Y.

SECURE

# ECONOMY

BY INSTALLING

# NON-CLINKERING GAS BENCHES.

DECREASE THE COST OF GAS MANUFACTURE AND REPAIRS.

INCREASE THE LIFE OF THE INSTALLATION AND THE YIELD.

This plant has 32 of our benches in operation and is making a net saving of over $14,000 per year by their use.

The above picture shows a portion of 10 new benches, now being installed at this plant, which when completed will make 42 benches in all. Write for our new Bulletin No. 2.

**THE IMPROVED EQUIPMENT CO.,**

**MAIN OFFICES: 60 WALL STREET, NEW YORK.**

**SOLE LICENSEES OF THE DOHERTY BENCH FUEL ECONOMIZER.**

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# CHEMISTRY OF GAS MANUFACTURE,

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**A PRACTICAL MANUAL FOR GAS ENGINEERS, GAS MANAGERS AND STUDENTS.**

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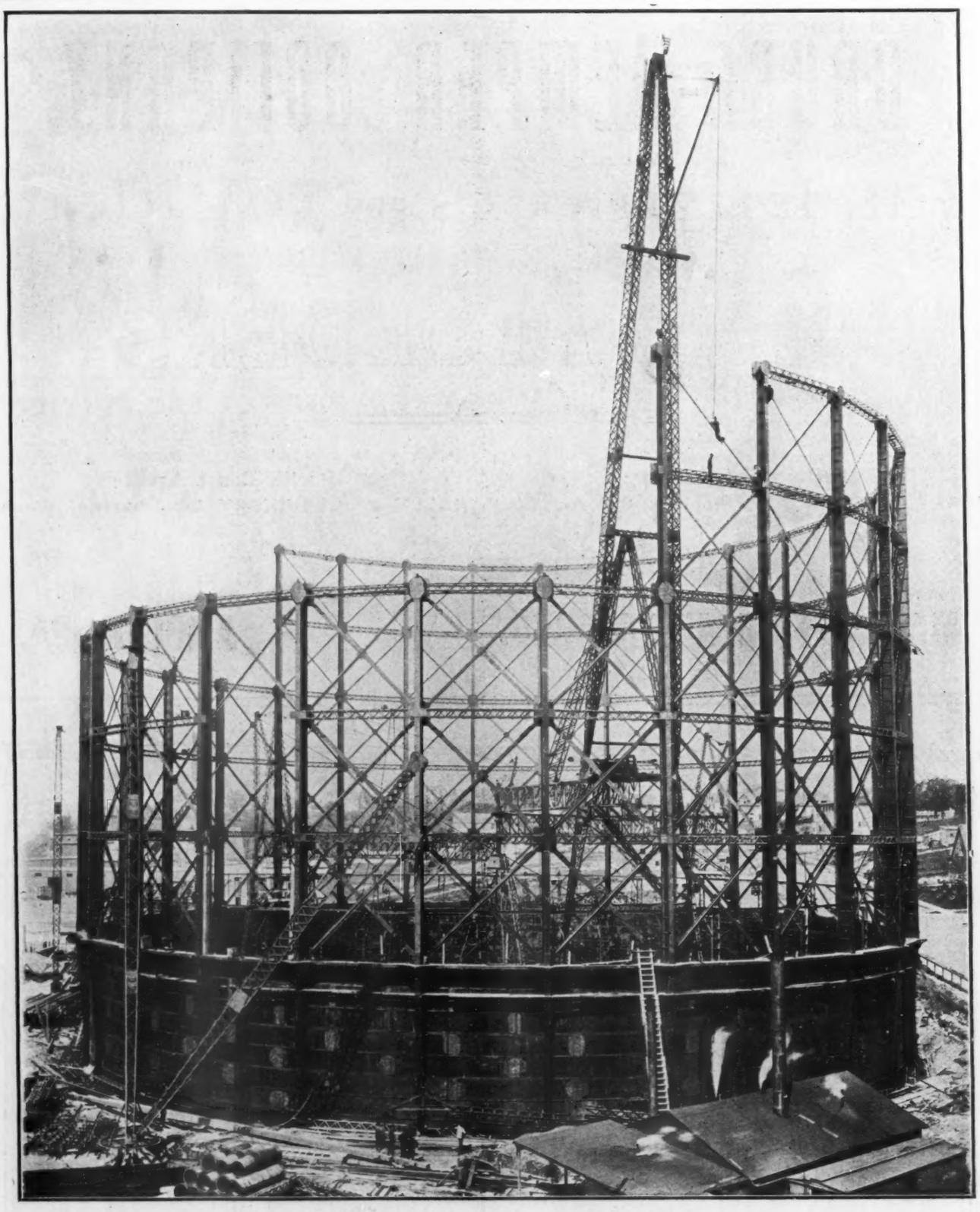

Erecting Gasholder Guide Frame with Electric Steel Traveling Derrick 225 Feet High.

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PLATE AND STRUCTURAL WORK OF EVERY DESCRIPTION.

COMPLETE COAL GAS PLANTS.

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## Gas Engineers and Builders.

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BENCH WORK
CHARGING AND DISCHARGING MACHINERY
MACKENZIE EXHAUSTERS
PRIMARY AND SECONDARY CONDENSERS FOR FRESH OR SALT WATER

ISBELL VALVES SPECIALS
TAR EXTRACTORS
P&A. TAR EXTRACTORS FOR WATER GAS
ROTARY AMMONIA SCRUBBERS
SHAVING SCRUBBERS PURIFIERS STREET GOVERNORS

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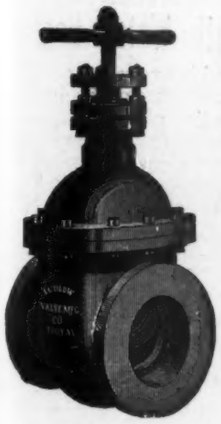
BRIDGE & OGDEN STREETS
NEWARK, N.J.
ESTABLISHED 1865



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**Ludlow Valve Mfg. Co.,**

TROY, N. Y., U. S. A.

Double and Single Gate Valves, ¼" to 72",

—FOR—

**Gas, Water, Steam, Oil, Ammonia, Etc.**

HOT GAS VALVES A SPECIALTY.

Send for Catalogue.

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**N. F. PALMER,**

Foot of 12th St. & East River, New York,

MANUFACTURERS OF

**GAS APPARATUS.**

Complete Works Erected.

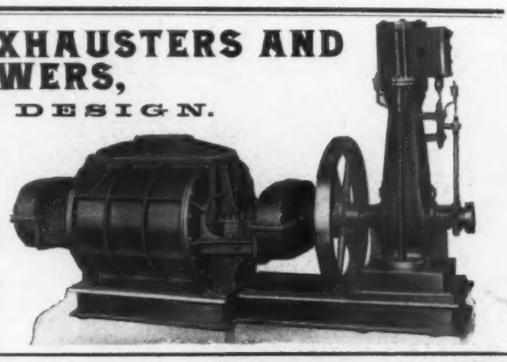
FREDERICK W. FLOYD, Engineer.

**POSITIVE GAS EXHAUSTERS AND BLOWERS,**

LATEST DESIGN.

Most Simple and Efficient Machine on the Market Let us figure on YOUR requirements.

THE PIQUA BLOWER CO.,
PIQUA, OHIO.



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**"LACLEDE-CHRISTY."**

BEST DESIGN,
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BEST IN THE WORLD.

**Humphrey Instantaneous Bath Water Heaters**

Should be used in every home. They make Hot Water **always** ready. Require no attention after installation. Hot water pours forth at any time upon lighting the gas. Close off the gas and all expense ceases. **Absolutely Guaranteed.**

**Special Merits.**

A burner that won't light back; a rust proof enameled shelf; a removable base plate for ready access to burner.

Shall we Send Catalog No. 9 and Discounts?

HUMPHREY CO.,
Kalamazoo, Mich., U. S. A.

WRITE for our Catalogue "O" just issued. This Catalogue deals entirely with "Brownhoist" Machinery as used at Artificial Gas Plants for handling coal, coke and other materials rapidly and economically.

THE BROWN HOISTING MACHINERY COMPANY,

Designers and Builders of All Kinds of Hoisting Machinery.

Main Office and Works:
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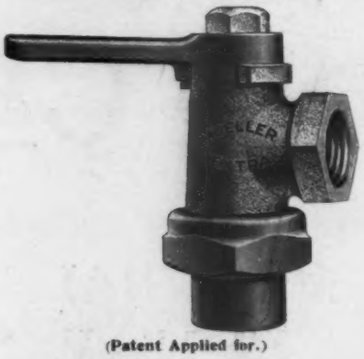
Oval Way,
Inside Thread, Union Coupling.



(Patent Applied for.)

Mueller Extra
Angle Pattern Stove Cock.

When it is desired to place the cock in the angle of a wall the Mueller Angle Pattern Stove Cock illustrated will be found very convenient. A union coupling is the only fitting required. The handle is adjustable to the position of the cock.

Made of red brass and Unconditionally Guaranteed.

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NEW YORK, N. Y., U. S. A.
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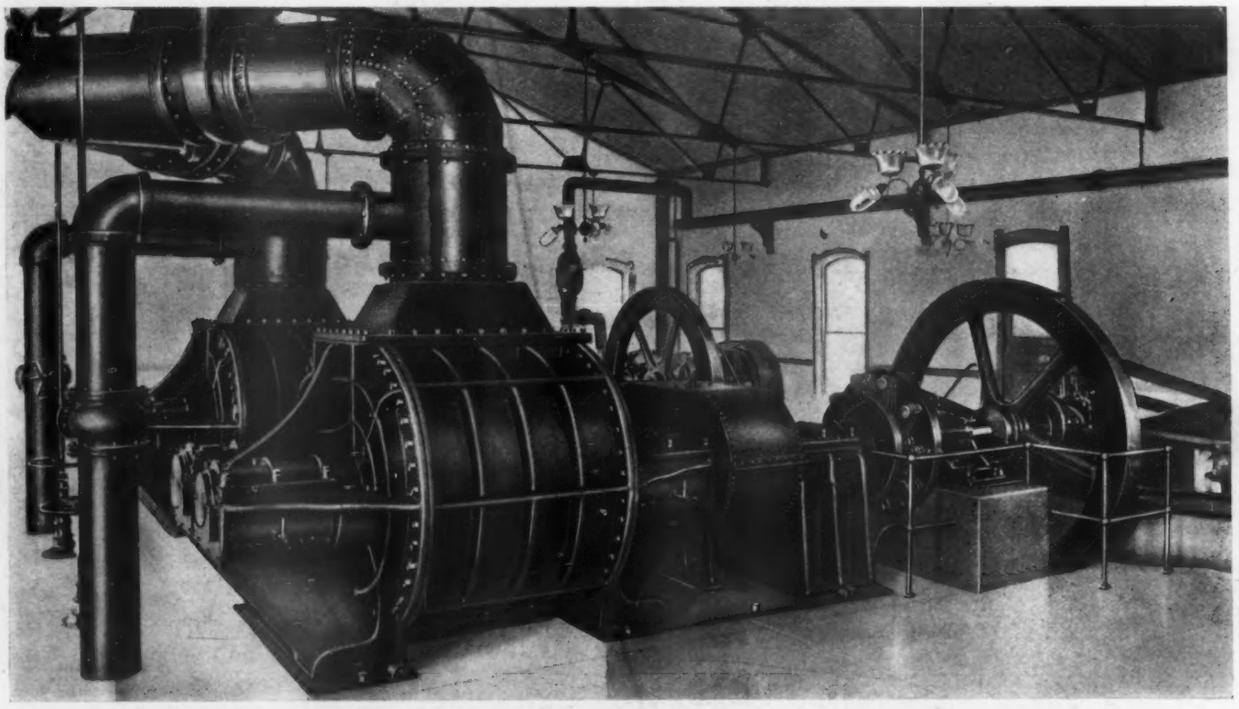
An installation of two units, each handling 800,000 cubic feet per hour, under 5 pounds per square inch, installed for the Peoples Gas Light and Coke Company, Chicago, Ills.



**P. H. & F. M. ROOTS COMPANY,**

HOME OFFICE: Connersville, Ind. NEW YORK OFFICE: 120-122 Liberty St. CHICAGO OFFICE: 1547 Marquette Bldg.

Send for pocket edition of Engineers' Practical Reference Book.

To insure maximum illumination with Humphrey Arc Lamps, we took up the manufacture of Arc Mantles.

Our sole aim is to produce the highest efficiency with Humphrey Gas Arc Lamps.

It seems to be up to us to set the standard in mantles as well as lamps.

We are now in a position to fill arc mantle orders promptly.

GENERAL GAS LIGHT COMPANY,

KALAMAZOO.

NEW YORK. SAN FRANCISCO.

GEORGE ORMROD, Pres. & Treas. JOHN D. ORMROD, Supt.
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MANUFACTURERS OF

**CAST IRON PIPE AND SPECIAL CASTINGS**

FOR WATER AND GAS.

Also, **FLANGE PIPE, LAMP POSTS, Etc.**

**THE BRISTOL CO.,**

Specialists in

**RECORDING INSTRUMENTS**

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— USE —

Bray's Special Burner.

**BRAY'S MARKET OR STANDARD BURNERS.**

For Markets, Meat Shops, Fruit Stands, Show Windows, Street Lamps, and all places where high candle power is required.

**These Burners Give a Large, Well-Shaped Flame.**

**They are Very Durable and Can be Depended Upon to Give Satisfactory Service for Years.**

Market burners can be furnished in Nos. 8 and 9. The Jumbo burner is 30-candle power size.

**Prices on Application.**

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Bray's Standard Jumbo.

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**GAS RETORT BENCHES, STOKING MACHINERY, STAND-PIPE CLEANER AND STRAIGHT STAND-PIPE SYSTEM.**

## GAS RETORTS AND FIREBRICK.

**We Manufacture Gas Retorts and Settings, Furnace Blocks and Fire Clay Tiles of Every Description.**

**Benches.**--We erect GAS RETORT BENCHES with Horizontal retorts having closed ends up to 10 feet in length, or Through retorts up to 20 feet in length.

**Slopers.**--Also, SLOPERS on improved lines for Inclined Retorts.

**Stoking Machinery.**--Sole Agents for U. S. and Canada for the Fiddes-Aldridge Simultaneous Discharging Charger. The "F. A.," or "One-Stroke" Machine. Cost of Carbonizing reduced to minimum. No Dust. Silent. No Waste of Coal. No Injury to Retorts.

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**Stand-Pipe Cleaner and Straight Stand-Pipe System.**--Agents for the sale of the Stand-Pipe Cleaner and Straight Stand-Pipe System of the United Gas Improvement Company.

**Retort Houses and Conveying Machinery.**--We also build Retort Houses, Coal and Coke Conveying Machinery. Plans, specifications and estimates cheerfully furnished.

***CORRESPONDENCE SOLICITED.***

ALL CONTRACTS MADE, AS OF ST. LOUIS.

# Directory of American Gas Companies, 1908.

**Price, $5.00.**
For Sale by
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# AMERICAN METER CO.,

**NEW YORK, ST. LOUIS, PHILADELPHIA, SAN FRANCISCO, CHICAGO,**

## Photometrical and Experimental Apparatus.


## PUBLIC LIGHTING TABLE.

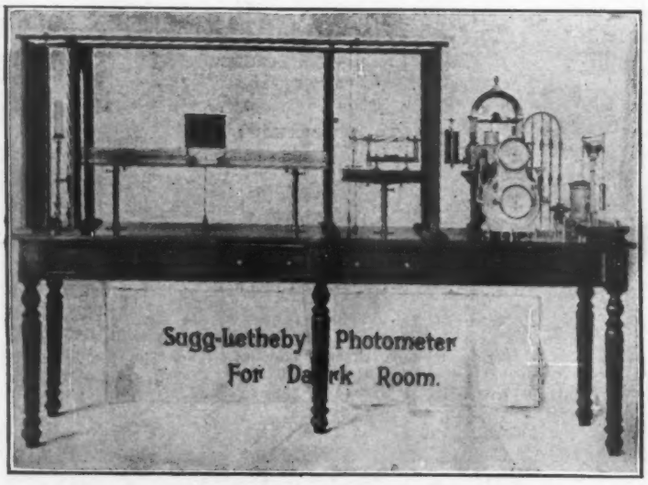
**JULY, 1908.**

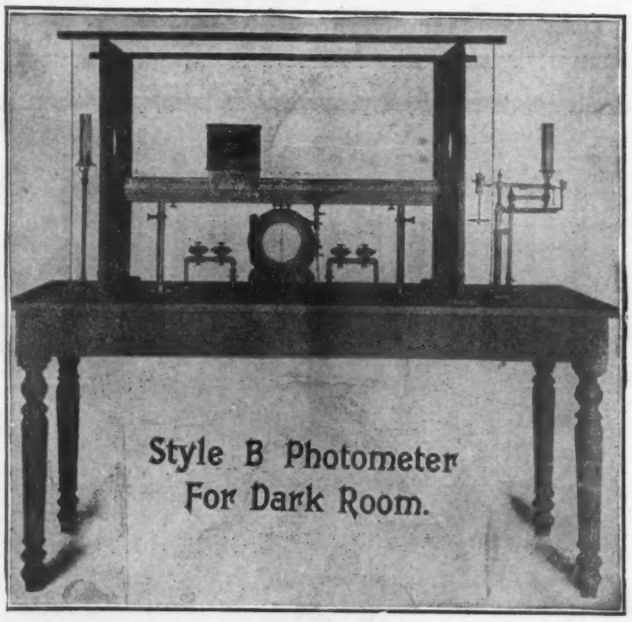
| Day of Week. | Date. | Table No. 1. Following the Moon. Light. | Extinguish. |
|---|---|---|---|
| Wed. | 1 | 8.00 PM | 3.30 AM |
| Thu. | 2 | 8.00 | 3.30 |
| Fri. | 3 | 9.50 | 3.30 |
| Sat. | 4 | 10.20 | 3.30 |
| Sun. | 5 | 10.40 | 3.40 |
| Mon. | 6 | 11.10 FQ | 3.40 |
| Tue. | 7 | 11 40 | 3.40 |
| Wed. | 8 | 12.10 AM | 3.40 |
| Thu. | 9 | 12.40 | 3.40 |
| Fri. | 10 | 1.20 | 3.40 |
| Sat. | 11 | 2.10 | 3.40 |
| Sun. | 12 | No L. | No L. |
| Mon. | 13 | No L FM | No L. |
| Tue. | 14 | No L. | No L. |
| Wed. | 15 | 8.00 PM | 10.20 PM |
| Thu. | 16 | 8.00 | 10.50 |
| Fri. | 17 | 8.00 | 11.30 |
| Sat. | 18 | 8.00 | 12.00 |
| Sun. | 19 | 7.50 | 12.30 AM |
| Mon. | 20 | 7.50 LQ | 1.00 |
| Tue. | 21 | 7.50 | 1.30 |
| Wed. | 22 | 7.50 | 2.00 |
| Thu. | 23 | 7.50 | 2.40 |
| Fri. | 24 | 7.50 | 3.50 |
| Sat. | 25 | 7.50 | 3.50 |
| Sun. | 26 | 7.50 | 4.00 |
| Mon. | 27 | 7.50 NM | 4.00 |
| Tue. | 28 | 7.50 | 4.00 |
| Wed. | 29 | 7.50 | 4.00 |
| Thu. | 30 | 7.50 | 4.00 |
| Fri. | 31 | 7.50 | 4.00 |

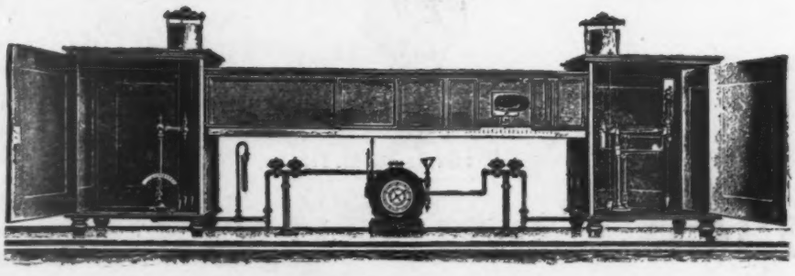
### TOTAL HOURS DURING 1908.

**By Table No. 1.**

| | Hrs.Min. |
|---|---|
| January | 228.30 |
| February | 187.30 |
| March | 192.00 |
| April | 160.10 |
| May | 155.10 |
| June | 138.00 |
| July | 155.50 |
| August | 173.40 |
| September | 185.20 |
| October | 214.00 |
| November | 218.10 |
| December | 226.40 |
| Total, yr. | 2235.00 |



Closed Photometer For Light Room.

**CIRCULARS SENT ON REQUEST.**

## PUBLIC LIGHTING TABLE.

**JULY, 1908.**

| Day of Week. | Date. | Table No. 2. New York City. All Night Lighting. Complete Lighting in One Hour From Time Given P. M. | Complete Extinguishing in 50 Minutes From Time Given A. M. |
|---|---|---|---|
| Wed. | 1 | 7.27 | 3.07 |
| Thu. | 2 | 7.22 | 3.07 |
| Fri. | 3 | 7.22 | 3.07 |
| Sat. | 4 | 7.22 | 3.07 |
| Sun. | 5 | 7.22 | 3.07 |
| Mon. | 6 | 7.22 | 3.07 |
| Tue. | 7 | 7.22 | 3.07 |
| Wed. | 8 | 7.22 | 3.07 |
| Thu. | 9 | 7.17 | 3.12 |
| Fri. | 10 | 7.17 | 3.12 |
| Sat. | 11 | 7.17 | 3.12 |
| Sun. | 12 | 7.17 | 3.12 |
| Mon. | 13 | 7.17 | 3.12 |
| Tue. | 14 | 7.17 | 3.12 |
| Wed. | 15 | 7.17 | 3.12 |
| Thu. | 16 | 7.12 | 3.17 |
| Fri. | 17 | 7.12 | 3.17 |
| Sat. | 18 | 7.12 | 3.17 |
| Sun. | 19 | 7.12 | 3.17 |
| Mon. | 20 | 7.12 | 3.17 |
| Tue. | 21 | 7.12 | 3.17 |
| Wed. | 22 | 7.12 | 3.17 |
| Thu. | 23 | 7.07 | 3.22 |
| Fri. | 24 | 7.07 | 3.22 |
| Sat. | 25 | 7.07 | 3.22 |
| Sun. | 26 | 7.07 | 3.22 |
| Mon. | 27 | 7.07 | 3.22 |
| Tue. | 28 | 7.07 | 3.22 |
| Wed. | 29 | 7.07 | 3.22 |
| Thu. | 30 | 7.02 | 3.27 |
| Fri. | 31 | 7.02 | 3.27 |

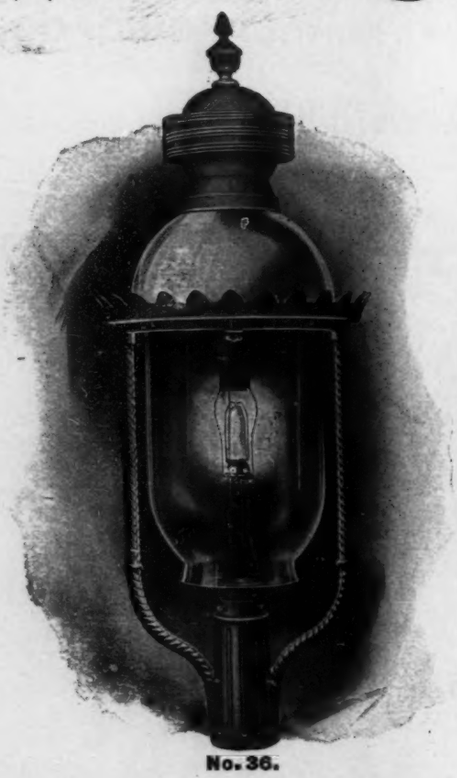
### TOTAL HOURS DURING 1908.

| | Hrs.Min. |
|---|---|
| January | 481.50 |
| February | 329.15 |
| March | 351.50 |
| April | 341.50 |
| May | 233.05 |
| June | 218.10 |
| July | 282.55 |
| August | 254.55 |
| September | 292.25 |
| October | 420.45 |
| November | 374.30 |
| December | 411.05 |
| | 3992.35 |
| Deduct on account of 50 min. extinguishing time | 30.30 |
| Total, yr. | 3962.05 |

NEW YORK, 318 West 42d Street. BOSTON, 820 Beacon Building. PHILADELPHIA, Broad and Arch Streets. ST. LOUIS, 712 Roe Building. CHICAGO, 218 La Salle Street. SAN FRANCISCO, 512 Oak Street.

# WELSBACH STREET LIGHTING COMPANY

....OF AMERICA....



No. 36.

Controls and Operates the **Welsbach System of Street Lighting,**

Which includes its specially DESIGNED and PATENTED BURNER for PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 130 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.

No. 38.

# The Chic Light.

ONE OF THE MOST POPULAR AND BEST SELLERS OF THE WELSBACH LINE.

For decorative appearance and large volume of light at a popular price to the consumer,

THE CHIC LIGHT

is practically alone in the field. Complete satisfaction to the user is its strong point.

THE CHIC LIGHT—Design No. 71310.

PRICES:

Boxed complete, with No. 71 Welsbach burner, No. 310 F. Q. M. cylinder, No. 196 Junior J Brand Welsbach mantle, including the No. 316 opal shade, which will be packed separately.

Price, complete, clear cylinder, each, dozen lots, . . . . . $1.35
Price, complete, clear cylinder, 100 lots, each, . . . . . 1.25

When supplied with **No. 310 F. Q. M. Opal Cylinder** add 10 cents to above list.

Price of Shade No. 316.
Package Contains 16 Dozen.

Price, per dozen, . . . . . $4.40
Price, original package, per dozen, . 4.00

WRITE FOR DISCOUNTS.

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Salesrooms in all Leading Cities of the United States.

# The United Gas Improvement Company,

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LESSEES, OPERATORS AND BUILDERS OF **GAS WORKS.**

Largest Builders of CARBURETTED WATER GAS PLANT IN AMERICA.

**SOLE AMERICAN BUILDERS**

OF THE

## Standard Double-Superheater Lowe Water Gas Apparatus.

## 1907 CONTRACTS.

**PARTIAL LIST OF PLACES:**

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Helena, Mont.
Bridgeport, Conn. (3d contract).
Suffolk, Va.
Winsted, Conn. (2d contract).
Nashua, N. H.
Augusta, Me. (2d contract).
Everett, Mass.
Jenkintown, Pa. (2d contract).
Coney Island, N. Y.
Mexico, Mo.
Jacksonville, Fla.
Syracuse, N. Y. (2d contract).
Atlanta, Ga. (2d contract).
Holyoke, Mass.
Peoria, Ills.
Schenectady, N. Y. (2d contract).
Danbury, Conn.
Galveston, Tex. (2d contract).
Quebec, Canada.
Indianapolis, Ind. (2d contract).
Bessemer, Ala.
Waterbury, Conn. (5th contract).
Sioux Falls, S. D. (3d contract).
Philadelphia, Pa.
New Hartford, Conn.
Poughkeepsie, N.Y. (2d contract).
Nashville, Tenn.
Salisbury, Md.
Norfolk, Va. (4th contract).
Wallingford, Conn.
Richmond, Va. (2d contract).
Oak Bluffs, Mass.
Arlington, Mass.

TOTAL SETS INSTALLED DURING YEAR, . . . . . 43
TOTAL SETS INSTALLED TO DECEMBER 31, 1907, . . . . . 677
TOTAL DAILY CAPACITY, TO DECEMBER 31, 1907, . . . . 545,865,000 cu. ft.

Tar Extractors for Carburetted Water Gas.
Photometrical Apparatus.
Gas Analysis Apparatus.
Recording Gauges.
Straight Standpipe System for Coal Gas Retorts.
Straight Standpipe Cleaners.
Waste Heat Boiler.
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Venturi Meter for Measuring Flow of Air Blast.

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H. D. ABERNETHY, Sec.

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Ground Fire Clay, Fire Sand and Ground Fire Brick in Barrels and Bulk.

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HALF AND FULL DEPTH AND FREE FIRING BENCHES,

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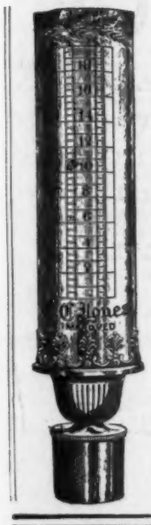

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**Iron Sponge, Purifying Material for Gas Purification, Manufacturers of Jones Jet Photometers, The National Smoke and Ammonia Helmet, Pressure Regulators, etc.**

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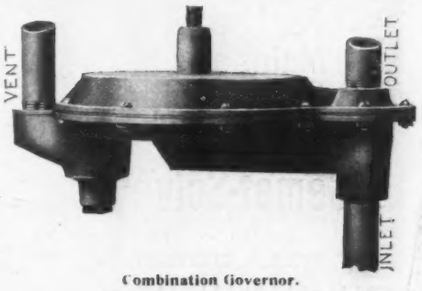


Combination Governor.
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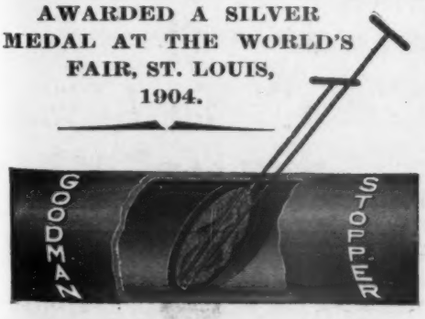


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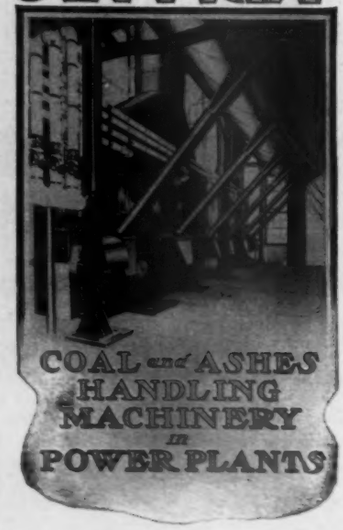


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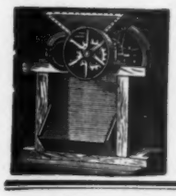

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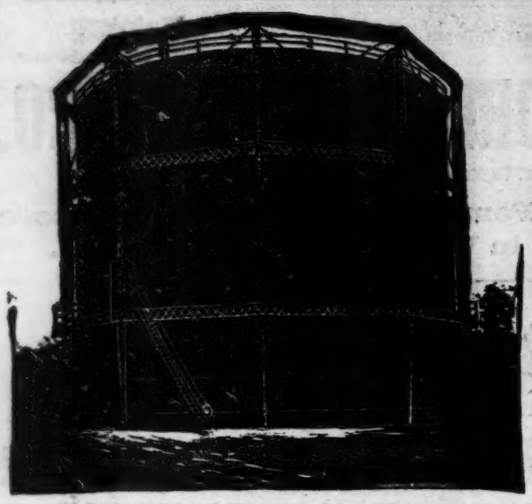

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These valves are provided with double discs or gates, and are tight with the gas pressure on either side of them.

The discs are so arranged as to be free from their seats when being opened or closed, and are operated by a quick-acting mechanism. The valve stem extends outside of the bonnet, and serves as an index, showing whether the valve is closed or open, and the amount of opening. They are made of the following dimensions:

| Size | 8 inches | 10 inches | 12 inches | 16 inches | 20 inches | 24 inches | 30 inches | 36 inches |
|---|---|---|---|---|---|---|---|---|
| Diameter of flanges | 13 inches | 16 inches | 18 inches | 22½ inches | 27 inches | 31 inches | 31¼ inches | 44 inches |
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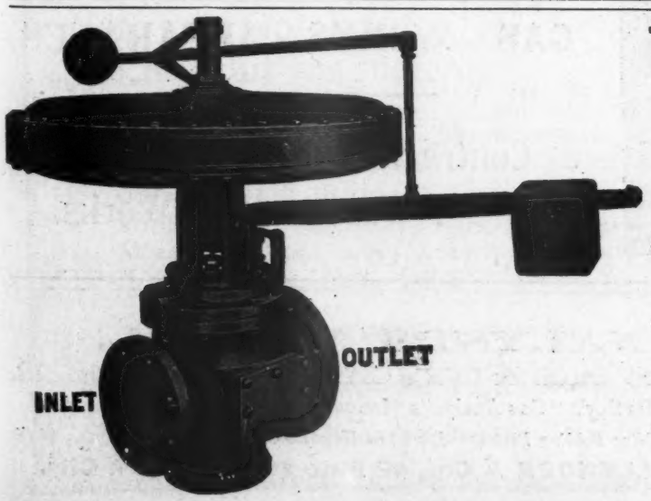


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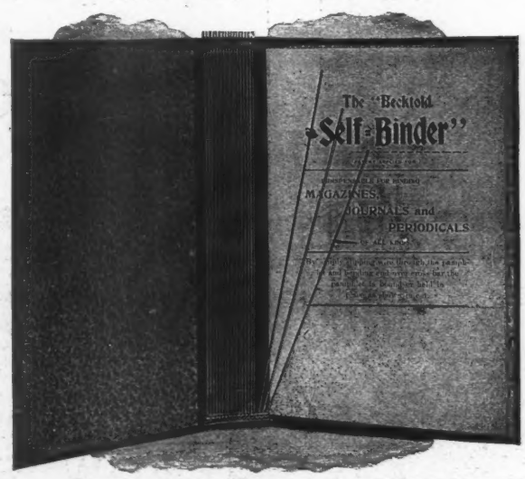


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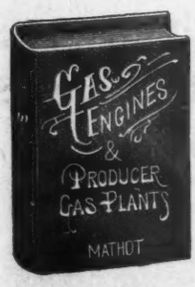


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